Should the Outsiders be Left Out? Director Stock Options, Expectations and Earnings Management*

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Abstract

We examine the impact outside directors stock options have on the quality of financial disclosure and transparency. We conjecture that providing outside directors stock options can lead to confounding effects on the reporting process. By aligning their interests with those of shareholders, directors should be more inclined to disclose relevant information to investors. Alternatively, stock options increase directors' compensation sensitivity to firm performance and thus may motivate collusion with management to misreport for short-term financial gain. We test the former conjecture by the relation between director stock options and expectations management of analysts' forecasts and the latter by the relation between director stock options and earnings management. Our results support the argument that paying outside directors with options promotes the dissemination of better information regarding the firm. This is reflected in initial forecast errors that are smaller, contain less variance, and have a greater probability of being accurately revised to meet actual earnings in a timely manner, regardless of whether the initial forecasts are positively or negatively biased. A comparison of director and CEO stock options reveals that CEO options only increase the likelihood of lowering overly optimistic expectations; we find no evidence consistent with CEO options increasing the likelihood of walking up pessimistic expectations. Thus, while performance pay to CEOs promotes the practice of maintaining and meeting low expectations, options to outsiders promotes disclosure regardless of the direction of the bias. We find no evidence to suggest director options increase the likelihood of earnings management. Overall, our results indicate that director stock options indeed provide directors with an incentive to promote shareholder interests, but unlike CEO stock options, do not add significant agency costs.

JEL Classification Code: G3, J33, M4
Key Words: Director Compensation; Stock Options; Analyst Expectations; Earnings Management

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1. Introduction

One of the primary responsibilities of corporate boards is reducing information asymmetries that exist between management and shareholders (Fama and Jensen, 1983). Jensen and Meckling (1976) argue that agency problems are present at all levels of the firm's hierarchy and suggest equity-based compensation as an effective tool in mitigating this problem between managers and shareholders. Consequently, as shareholders' agents, outside directors are often awarded stock options to align their interests with the interests of shareholders.[1] Indeed, Monks and Minow (2011) note that there has been a shift over the last two decades to increasingly compensate directors with stock options. Since 1995 the National Association of Corporate Directors has recommended that boards pay their directors solely with options and cash and that at least 50% of pay come in the form of equity (NACD, 2010a).

Providing outside directors with stock options, however, can lead to confounding effects on the reporting process. On the one hand, by aligning their interests with those of shareholders, directors may become more inclined to disclose relevant information to investors. If stock option-based compensation provides a motive for directors to fulfill this duty, one would expect better information flow to the outside investor and consequently fewer surprises regarding firm performance (Cotter, Tuna and Wysocki, 2006). On the other hand, stock options increase directors' sensitivity to the firm's current stock price and may provide incentive to collude with management and misrepresent the company's financial position for short-term financial gain.

The extant literature on executive compensation suggests that stock option-based compensation contracts can induce moral hazard. For example, CEOs with options tend to pursue riskier investments (Smith and Watts, 1992), manipulate earnings (Burns and Kedia, 2006 and Efendi, Srivastava, and Swanson, 2007), commit fraud (Denis, Hanouna, and Sarin, 2006),

[1] In the 1997 proxy statement of National Semiconductor Corp. on the initiation of a stock option plan for director *"… the option plan will promote the recruiting and retention of highly qualified individuals to serve as directors and will also strengthen the commonality of interest between directors and shareholders"*

and take on negative NPV projects (Byrd and Hickman, 1992 and Cotter, Shivdasani and Zenner 1997). Bolton, Scheinkman, and Xiong (2006) argue that stock options may induce managers to focus on the short-term stock price at the expense of long-run fundamental value. Therefore, similar to executive stock options, director stock options may induce moral hazard and result in high prevalence of earnings management in firms with significant levels of director option pay. Indeed, while the prevalence of director stock options peaked in 2002, compensation committees have recently curbed their use due to fears of inducing myopic behavior.[2]

Directors have incentives to develop reputations as expert monitors by protecting shareholders' interests (Fama and Jensen, 1983). Del Guercio, Seery, and Woidtke (2008) show that directors intensify their monitoring efforts when individually scrutinized by dissatisfied activists and Yermack (2004) finds that focusing on shareholders' interests is the key to maintaining their directorship as well as obtaining additional outside board seats. While directors delegate most firm decisions to executives, they do have the tendency to encourage or discourage management behavior. Specifically, Klein (2002) and Xie, Davidson, and DaDalt (2003) show that board composition plays a significant role in affecting abnormal accruals. Consequently, unlike CEO stock options, director options may not promote the moral hazard concerns associated with myopic behavior which compromise their reputations to receive only modest financial benefits (Harford, 2003).

The primary motive of this paper is to address the question of whether stock option-based compensation provides incentives for outside directors to engage in either expectation and/or earnings management. To examine this question we first test the relation between director options and the dissemination of information to outside investors. Directors, as shareholders' representatives, are responsible for monitoring and disseminating the performance

[2] In 2002, 75% of the NACD's top-200 firms compensated their directors with stock options. By the 2009 proxy season, this number had fallen to 27%. The National Association of Corporate Directors attributes this decline, in part, to the fact that "governance critics increasingly have blamed stock option grants for engendering an excessive focus on short-term performance gains" (NACD, 2010b).

of management and should therefore guide investors toward the actual level of firm earnings. To investigate this question we use analysts' forecasts, which we assume are the product of a scientific approach that incorporates available market information. If director stock options facilitate information flow, then providing option based-pay to outside directors should yield analysts' estimates that are more accurate and lead to forecast revisions towards the actual level of earnings as the reporting date approaches.

Second, we investigate the link between director stock options and earnings management. Previous literature posits that earnings are affected by management's discretion in adopting accounting procedures primarily through the use of accruals (Dechow, Sloan, and Sweeney, 1995; Teoh, Welch, and Wong, 1998a,b). This literature also suggests that, due to the significant impact missed estimates has on firm value, management exercise their discretion more when they are about to miss analysts' estimates (Kasznik and McNichols, 2002; Cheng and Warfield, 2005). Thus, firms on the verge of missing analysts' forecasts are most likely to have large levels of accruals. If director stock options induce self-dealing, then we would expect direct association between director stock options and positive accruals for firms about to miss analysts' forecasts. We would also expect firms with underestimated earnings forecasts to 'cookie jar' their earnings and manage them downward for future periods. Director stock options again may exacerbate this effect.

Our analysis reveals that compensating outside directors with stock options promotes the dissemination of information to investors. Tests show that incentivizing outsiders with options increases the accuracy and decreases the variance of both initial and final earnings estimates. An examination of changes in analyst estimates during the fiscal year further indicates that higher levels of director option pay increases the likelihood of both a downward revision to positively biased estimates and an upward revision to negatively biased estimates to meet the actual reported earnings. That is, outsider stock options increase the likelihood of walking down

expectations that the firm is likely to miss, and walking up those expectations that they are predisposed to beat. Evidence also suggests one mechanism through which the board disseminates information to induce analyst revision is the intra-year quarterly EPS release. Namely, subsequent to the quarterly release, analysts revise their estimates quicker and with greater accuracy when outside directors are compensated with options. This indicates that high pay-for-performance boards encourage more corporate earnings guidance at the quarterly conference calls. These results further support the notion that incentive pay to outsiders promotes information transparency.

Analysis of the CEO, however, reveals that high levels of CEO options only increases the likelihood of downward revisions to meet expectations; we find no evidence consistent with CEO performance pay increasing the likelihood of walking up pessimistic expectations. Thus, while performance pay to CEOs promotes the practice of maintaining and meeting low expectations, options to outsiders promotes disclosure regardless of the direction of the bias. Collectively, these results suggest that directors with stock-based compensation are more involved in guiding analysts and outside investors concerning firm performance. The findings are robust to the inclusion of firm characteristics known to affect analysts' forecast accuracy, and variables reflecting CEO's influence within the firm as well as unobservable factors through the use of firm-fixed effects. We conclude that these results support the argument that stock options for outside directors facilitate information flow regarding firm performance to outside investors and indeed align the interest of directors and shareholders.

Consistent with Burns and Kedia (2006), we also find that earnings management is increasing in the amount of CEO option pay. However, compensating outside directors with options has no incremental impact on the management of earnings. We fail to uncover any evidence that director stock options promote collusion between directors and managers in managing earnings to meet market thresholds. Thus, the benefits of better information flow to

investors from providing director stock options are not offset by significantly increased agency costs.

Our paper contributes to the existing literature which documents the effectiveness of director stock option grants in mitigating the agency problem between shareholders and managers when provided over extended periods of time (Yermack, 2004 and Vafeas, 1999). Second, it provides evidence that director stock options are positively related to increased disclosure regarding firm performance. Finally, we support the argument in Fama and Jensen (1983) and Harford (2003) that directors should earn modest levels of financial benefits. Our results indicate that at their current levels, director stock options do not generate high disclosure-related agency costs like CEO stock options.

The results contained in this paper also have clear implications regarding firm value. It may be that the long-term shareholder is unconcerned with the short-term timing of reported earnings. The cash flows of the firm, regardless of the management of expectations or earnings, are going to be what they are. However, the enhanced disclosure engendered by director stock options reduces the level of information asymmetry that exists between principles and agents (Myers and Majluf, 1984). If this asymmetry is priced, then mitigating it should serve to reduce the cost of capital, thereby enhancing firm value. Indeed, Hobbs, Kovacs, and Sharma (2012) find the frequency of analyst revisions is associated with outperformance. Hence, our results further contribute to the literature by providing supporting evidence for the arguments made by Fich and Shivdasani (2005) that stock option-based pay for corporate directors serves to increase shareholder wealth.

The rest of this paper will proceed as follows. The next section develops the hypotheses of the paper. Section three describes our data and methods. Section four presents the main empirical findings and section five examines the robustness of these results. Section six concludes.

2. Hypothesis Development

2.1 Expectations Management and Analysts' Forecasts

Board members have a fiduciary responsibility to monitor management and supervise firm operations. Through their supervisory role over the internal and external audit process, directors verify the validity of the information presented in financial statements.[3] Although the board is represented by the audit committee when performing this function, ultimately all directors are expected to fulfill this role.[4]

Fama and Jensen (1983) argue that outside directors are effective monitors because they have reputational concerns.[5] Indeed, outside directors are elected to the board for the value of their human capital - professionals in the business, prestigious figures in the community, reputable expert monitors, and other similar reasons.[6] In the 1990s, equity compensation contracts, and stock options in particular, were introduced as an additional form of incentive for outside directors to fulfill their duties. Stock options are expected to motivate holders to increase the value of the firm. For outside directors this means they should exert more effort in overseeing management and disclose greater and more accurate information that aid investors in making valuation decisions.

In previous literature (e.g. Klein, 2002 and Anderson, Mansi and Reeb, 2004), the supervisory role of directors is examined by looking at board and committee structure. Recent studies on director stock option compensation and board behavior reveal somewhat mixed

[3] The 1999 Blue Ribbon Committee Report on Improving the Effectiveness of Corporate Audit Committees states, "The audit committee… oversees the work of the other actors in the financial reporting process -- management, including the internal auditor, and the outside auditors - to endorse the processes and safeguards employed by each."

[4] Pursuant to the Exchange Act of 1934 [Sections 13(f)(4) / 15(d)], a majority of the board must authorize the annual disclosures [10-K, Annual Reports] and are required to sign-off on these filings.

[5] Other researchers focus on board composition and ownership as underlying factors for enhancing board effectiveness. For example, Smith (1996) and Carleton, Nelson and Weisbach (1998) present evidence that boards with institutional investors are able to effect governance changes. Weisbach (1988) argues that more independent boards increase the likelihood of CEO turnover in poorly performing firms. Anderson, Mansi and Reeb (2004) find that independency of the board is negatively related to the cost of financing, suggesting that independence improves the reliability of the accounting information.

[6] GE's team of outside directors in 2002 consisted of 9 chairmen, CEOs and/or presidents, 2 retired chairmen, a retired vice president of other firms, a university president, and a business professor at Harvard University.

results. Harford (2003), studying a 1988 to 1991 sample, finds that directors' financial compensation is relatively small and unlikely to affect board decisions. However, Yermack (2004) finds that current director compensation contracts have become a significant factor in motivating directors to fulfill their duties.[7] If stock options create additional incentives for directors to perform their duties and circulate better information, then we would expect greater precision in initial analysts' forecasts for those companies compensating outside directors with stock options.

An alternative approach to assessing information flow to analysts, and ultimately investors, is to examine the disparity among the forecasts themselves. If director stock options promote the dissemination of accurate information we should expect the variance of both initial and final estimates to be decreasing in director option pay. Hypothesis 1 addresses these points as follows:

> ***H1****: The likelihood of small initial analysts' forecast errors is positively related to outside director option sensitivity while the disparity of analysts' estimates in a given forecast period is negatively related to outside director option sensitivity.*

Cotter, Tuna and Wysocki (2006) argue that optimistic analysts' forecasts prompt earnings guidance by firm management. Richardson, Teoh and Wysocki (2004) find a relationship between earnings guidance, insider trading of top executives, and directors in the firm. Similarly, Koh, Matsumoto and Rajgopal, (2006) argue that, due to regulatory pressure, managers publicize information about firm performance to align estimates with reported earnings.

Since directors are responsible for monitoring and disseminating the performance of management, we expect them to guide investors towards the actual level of firm earnings. If

[7] Examples of recent work on director compensation are Perry (2000), Bryan, Hwang, Klein and Lilien (2000), Brick, Palmon and Wald (2002) and Ertugrul and Hegde (2008). Perry (2000) finds a positive association between director incentive compensation and CEO turnover in poorly performing firms; Bryan, Hwang, Klein and Lilien (2000) identifies the economic determinants of director compensation; and Brick, Palmon and Wald (2002) argue that the positive relation between CEO and director compensation suggests weak monitoring. Finally, Erturgrul and Hegde (2008) document a negative relation between director stock options and yield spreads on the firm's outstanding bonds.

directors directly or indirectly disseminate accurate information regarding the firm following upward biased analyst estimates, we should expect downward revisions in forecasts in the periods leading up to the reporting of earnings. In other words, we argue that director stock options motivate directors to exert more effort to disseminate information, either through direct reporting or coercing management to do so. We therefore conjecture a positive relation between outside director stock options and the probability that a firm with upward biased estimates experiences a downward revision to meet actual earnings. If outside director stock options promote information flow to investors, initial earnings estimates that are biased low should also lead to an upward revision to meet earnings. Hypothesis 2 is therefore:

> ***H2***: *The likelihood of a downward revision in analysts' forecasts to meet actual earnings following a positively biased estimate is increasing with outside director option sensitivity. The likelihood of an upward revision in analysts' forecasts to meet actual earnings following a negatively biased estimate is increasing with outside director option sensitivity.*

2.2 Earnings Management and Accruals

The first two hypotheses revolve around the notion that increased director stock option compensation motivates directors to disclose better information. In this respect, analysts and investors will be better equipped to make decisions. However, a large body of literature suggests that firms can also achieve current and future earnings targets by managing earnings. For example, Burgstahler and Eames (2006) argue that firms employ both expectation and earnings management to meet or beat analysts' forecasts.

Stock option compensation can help facilitate this behavior since higher stock option pay to directors increases the directors' sensitivity of wealth to higher values of the underlying stock. This feature of option compensations has been argued to motivate self-dealing for corporate executives. For example, Burns and Kedia (2006) find significant negative association between CEO stock option compensation and the accuracy of reported earnings. Like CEOs, outside directors can increase the short-term value of their stock options by working with management to attain market targets. Alternatively, outside directors may have less financial

incentives to compromise their reputation. Thus, in this paper we also examine whether or not outside directors collude with management in order to meet market thresholds by managing earnings.

Existing accounting rules and procedures allow great discretion for managers regarding reporting accounting information. For example, managers can choose among many inventory methods, capital leases, and methods of expensing research and development. Previous literature explores managers' incentives to manipulate financial reporting in order to achieve market thresholds, and that firms reward their executives upon achieving target earnings (Healy, 1985). Thus, the adoption of accounting rules is related, to a considerable extent, to the reward received from achieving target earnings. Bergstresser and Philippon (2006) find higher levels of earnings management in firms with more equity-based compensation. Likewise, Burns and Kedia (2006) find that executives are more likely to manage earnings when stock options constitute a significant portion of their annual pay.

The implication is that compensation schemes provide an incentive to manage earnings in order to achieve short-term financial gain. Particularly, Degeorge, Patel and Zeckhauser (1999) and Cheng and Warfield (2005) show that firms manage earnings to meet short-term earnings forecasts. Others have related earnings management with major corporate events such as capital raising (Teoh, Welch and Wong, 1998a and 1998b); the acquisition of other firms (Erickson and Wang, 1999); and meeting dividend thresholds (Daniel, Denis and Naveen, 2008). In this respect, given their supervisory and advisory role, outside directors receiving stock option-based compensation may be more conciliatory with management in managing earnings upward in order to meet analysts' forecast estimates. They also might be complicit to manage earnings downward in the face of pessimistic forecasts, creating reserves for future periods. Therefore, we propose the following hypothesis:

***H3**: Evidence of earnings management following positively biased earnings estimates is positively related to outside director option sensitivity. Evidence of earnings management following negatively biased earnings estimates is positively related to outside director option sensitivity.*

3. Data and Methods

3.1 Sample Selection Criteria

The primary dataset used in this study consists of compensation data available on Standard and Poor's Executive Compensation data file (Execucomp). Execucomp includes data on S&P 500, S&P Midcap 400 and S&P Smallcap 600 firms. We retain only the firms with complete data for director and CEO compensation, analyst earnings per share estimates, and company financials on Execucomp, I/B/E/S, Compustat, and CRSP, respectively. Director and CEO characteristics, board characteristics, accruals, and other firm variables are constructed to test our hypotheses. Since both director and CEO compensation is cumulated over the previous five years, our tests are conducted on a panel of firm level data from 1997 through 2006. The final sample contains 7,071 firm-year observations.

3.2 Option Portfolio Sensitivities and Governance

The central question of this paper is whether stock option-based compensation provides incentive for outside directors to be involved in expectation and earnings management. Following Core and Guay (1999), we define stock option pay-for-performance sensitivity as the change (i.e. delta) in value of the aggregate stock option portfolio to a one percent change in stock price. We define the sensitivity of the five-year option portfolio at time *t* as the PPS sum of the previous four years of options granted and the current option grant (i.e. grants $i = -4 \ldots 0$).[8]

[8] Using five-year cumulative measures, rather than one-year measures, for director and CEO incentive compensation is important since prior work shows that compensation has a greater impact on behavior after it has become a significant portion of overall wealth; especially for directors. Vafeas (1999) observes an increase in equity holding of outside directors three years after initiation of stock option plans. Yermack (2004) notes that the propensities to take risk increase as directors accumulate stock options over several years. In addition, Efendi, Srivastava and Swanson (2007) find that the tendency by corporate managers to misstate financial statements increases as their holdings of in-the-money stock options increase.

$$Option\ Portfolio\ PPS_t = \sum_{i=-4}^{0} Option\ Grant\ PPS_i \quad (1)$$

$$Option\ Grant\ PPS_{i,t} = \partial\left(Option\ Value_{i,t}\right)/\partial(Price_t) \times (Price_t/100) \times Num\ Options_i \quad (2)$$

Option Value$_t$ is the Black-Scholes value per option at time *t* of the *i*th granted option, *Price*$_t$ is stock price at time *t*, and *Num Options*$_i$ is the number of options given to the director at the *i*th grant.

We adopt three proxies that reflect option incentives to outsiders. The first is the portfolio value sensitivity from equation (1) for a representative individual outside director with five years of tenure (*Individual Outside Director PPS*).[9] The second measure cumulates the individual option portfolio sensitivities of all the outside members of the firm's audit committee (*Audit Committee Director PPS*).[10] The final measure is the total PPS for all outside directors on the board (*Outside Director PPS*). Since each of the outside directors or members of the audit committee may not all have five years of tenure at the firm, the second and third measures may differ materially from the individual director metric when board turnover is high.

Similarly, we calculate *CEO PPS* as the sensitivity of the CEOs five-year option portfolio to a one percent change in stock price. Controlling for CEO option pay sensitivity is particularly important since we are interested in the incremental impact outside director compensation has on information and earnings management. There is substantial skewness in each of these variables, so we follow Core and Guay (1999) and use the logarithmic transformation in all regression tests to mitigate the influence of outliers.

Other board and governance characteristics which could have effects on director behavior are also incorporated in our tests. As argued by Hermalin and Weisbach (1998), it is the relative power of the CEO to outside directors that determines the degree of governance in the

[9] If at least one outsider has been at the firm for five years, this may be interpreted as the five-year PPS of the senior-most independent director on the board

[10] The median firm in our sample retains an audit committee made up of 100% outside directors.

firm. Therefore, we include board size, the proportion of outside directors on the board, and the proportion of outside directors on the audit committee. We also include CEO tenure, CEO-Chairman duality, and percentage of equity ownership in the firm for both the CEO and the outside directors.

[Figure 1]

3.3 Analysts' Expectations

In this paper, we investigate whether the directors' supervisory role is enhanced with stock option compensation. Specifically, we test the role of directors in disseminating information to outside investors by examining analyst forecasts at the beginning and end of the fiscal year, and by monitoring the adjustment of the forecasts until the firm's actual reporting of earnings. Our method of measuring expectations management follows that of Bartov, Givoly and Hayn (2002) as applied to annual earnings forecasts. Specifically, we remove any estimate without an earnings announcement date, those that are issued prior to the start of the fiscal year, and those issued less than three days before the earnings announcement itself. Consistent with DellaVinga and Pollet (2009) and Hirshleifer, Lim, and Teoh (2009), we use the earlier of the reported announcement dates from I/B/E/S and Compustat to ensure accuracy.[11]

Following Bartov *et al.*, we define *Initial Earnings Forecast* as the first annual earnings forecast that occurs in the fiscal year and the *Final Earnings Forecast* as the latest analysts forecast three days before the actual reporting of earnings. We then measure analyst *Forecast Error* as the difference between the initial earnings forecast and actual earnings. *Earning Surprise* is the difference between the final earnings forecast and reported earnings per share. *Earnings Revision* is the difference between the initial and final earnings forecast. We require that at least two forecasts are provided for the firm to enter our sample. Therefore,

$$\text{Forecast Error} = \text{Actual EPS} - \text{Forecast EPS}^{\text{initial}} \quad (3)$$

[11] DellaVinga and Pollet (2009) report over 95% accuracy using this technique for post-1994 I/B/E/S data.

$$\text{Earnings Surprise} = \text{Forecast EPS}^{\text{final}} - \text{Actual EPS} \quad (4)$$

$$\text{Earnings Revision} = \text{Forecast EPS}^{\text{final}} - \text{Forecast EPS}^{\text{initial}} \quad (5)$$

Dummy variables are developed from the above measures which enable us to test whether there is influence in guiding forecasts to actual earnings. A dummy variable for *Positive Bias* is equal to one if forecasted earnings meet or exceed actual earnings (i.e. Forecast Error ≤ 0) and zero otherwise. The complement of this, *Negative Bias,* is equal to one if forecasted earnings are below actual earnings (i.e. Forecast Error > 0). *Small Initial Error* dummy is equal to one if the initial forecast error is within $0.03 of the actual (-$0.03≤ Forecast EPS$^{\text{initial}}$ – Actual EPS ≤$0.03) and zero otherwise. An illustration of this process is provided in Figure 1.

To test H1, we investigate the relation between small initial errors and director stock options. H1 is supported if our three measures of outside director option pay sensitivity (Individual Outside Director PPS, Audit Committee Director PPS, and Outside Director PPS), are positively related to small initial forecast errors. To further test H1 we calculate the standard deviation of the estimates at the initial earnings forecast and those at the final earnings forecast. H1 is also supported if the standard deviations of the initial and final forecast estimates are decreasing in our director PPS measures. To test H2 we isolate firms with downward earnings revisions (i.e. Earnings Revision < 0) to initial positive forecast biases and test the association of outside director option pay to meeting actual earnings. This hypothesis is supported if higher option pay sensitivity increases the likelihood of meeting actual earnings. We also test H2 by identifying firms with upward revisions to negatively biased analysts estimates and test the relation between option pay sensitivity and the ultimate meeting of earnings. H2 is supported if the likelihood of meeting earnings increases in the level of outside director option pay sensitivity.

3.4 Measuring Earnings Management

To test H3 we calculate discretionary accruals. GAAP permits flexibility in the choice of accounting rules to present the financial condition of the firm. The most common proxy for

earnings management is the change in the level of accruals. Accruals arise from the normal conduct of business operations (nondiscretionary accruals) and from management discretion in the presentation of business operations (discretionary accruals). In testing H3, we focus on the level of discretionary accruals to determine whether incentives to the controlling body of the firm pressures management to alter reporting practices. We follow the methodology developed by Jones (1991) and modified by Dechow, Sloan and Sweeney (1995) to calculate total and discretionary accruals. Total accruals (TA) are calculated as follows:

$$TA_t = (\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t) / A_{t-1} \quad (6)$$

Where ⊿ represents the annual change in the variable, *CA* is current assets, *CL* is current liabilities, *STD* is the portion of long-term debt in current liabilities, *Dep* is depreciation and amortization expense, A is total assets and t is time. To calculate discretionary accruals, we first fit non-discretionary accruals (NDA_t) by running the following regression:

$$NDA_t = a_1 (1/A_{t-1}) + a_2 (\Delta REV_t - \Delta REC_t)/ A_{t-1} + a_3 (PPE_t)/A_{t-1} + e_t \quad (7)$$

Where *REV* is total sales; *REC* is total receivables; *PPE* is property, plant and equipment; and e is the residual. The basic argument is that predicted values from equation (7) determine the nondiscretionary accruals that develop from the normal course of business. The difference between the predicted and actual values of total accruals is the discretionary accruals (DA_t) arising from managers' choice of accounting rules and procedures.

$$DA_t = TA_t - NDA_t \quad (8)$$

Support for Hypothesis 3 would suggest that providing outside directors with stock options leads to the management of earnings either upward or downward in response to positively and negatively biased earnings estimates, respectively. Evidence contrary to this hypothesis would indicate that the benefits shareholders receive by awarding outside directors with stock options are not offset by increased agency costs and earnings management.

[Table 1]

3.5 Sample Characteristics

Table 1 presents summary statistics for our sample. The average (median) size of a firm in our sample is $8.4 (2.0) billion as measured by total capitalization which is defined as the market value of common equity plus the book value of debt. The market to book of the average firm in our sample is 4.86 using about 5% of total assets for research and advertising expenses. Corporate directors are compensated in several ways for their service, with their pay packages typically consisting of cash retainers, meeting fees, committee pay, restricted stock, and stock options. The median outside director in our sample receives $129,209 in total annual pay. This is consistent with the results of a 2009-2010 survey by the National Association of Corporate Directors that find the median total compensation for a corporate director ranges from $75,490 to $216,186, depending on firm size.[12] Further, stock options constitute a significant fraction of their pay package as our sample directors earn $62,316 (around 48%) of their compensation in the form option grants. In addition, a one percent increase in share price results in an average $11,330 increase in value of the director stock option holdings accumulated over the previous five years.

The average CEO in the sample receives about $5.3 million in total annual pay, of which 57% is in the form of stock options. Further, for the CEO, a one percent increase in share price results in an increase of $230,750 in the five-year accumulated option holdings value. The typical CEO has ownership of about 2 percent of the outstanding shares, whereas the total ownership held by all outsiders is 1.17%. The average CEO has a tenure of 7.57 years in the firm and is 55 years old; 61% of CEOs serve as chairman of the board. Finally, the typical board size in our sample consists of 9 directors, 6 of which are outsiders. The majority of board members on the audit committee (91%) are composed of outsiders. These statistics are comparable to those

[12] The NACD (2010b) finds that the median pay for corporate directors is $75,490 at 'smaller companies' ($50M-$500M), $108,836 at 'small companies' ($500M-$1B), $131,054 at 'medium companies' ($1B-$2.5B), $164,455 at 'large companies' ($2.5B-$10B), and $216,186 at 'Top 200 companies' (>$10B).

reported in other large sample studies examining director or CEO compensation as well as corporate governance measures (Ryan and Wiggins, 2004; Fich and Shivdasani, 2005; Coles, Daniel, and Naveen, 2008).

Examining the analyst forecasts, roughly half of the firms in our sample experience positively biased earnings forecasts at the start of their fiscal years[13] with the median forecast overestimating firm earnings by $0.01. The standard deviation of initial forecasts is $0.04 for the median firm. Around 97% of these initial estimates are revised either upward or downward by at least $0.01[14] and the disparity of estimates tightens with time, as evidenced by the $0.02 estimate standard deviation as of the final forecast date. Looking at the firm's accounting choices, the typical firm in our sample does little in the way of earnings management. The mean (median) level of discretionary current accruals is -0.05% (+0.09%) of total assets. However, there is substantial cross-sectional variation as evidenced by the 1st and 3rd quartile points of -12.7% and +13.9% of total assets, respectively.

4. Empirical Results

4.1 Outside Director Stock Options and Earnings Expectations

We begin our analysis of outside director stock options and the agency problem between managers and shareholders by examining the association between director stock options and the dissemination of information to outside investors. H1 and H2 predict that analyst forecast errors, and in particular changes in forecast errors, signal the process through which the market incorporates information and sets expectations. If director stock options facilitate information

[13] Of the 7,071 total observations, 3,838 experience positively biased forecasts while 3,233 face negatively biased forecasts. It should be noted that, under our classification schema for positively biased forecasts, there are 145 observations in which estimates exactly equal the actual EPS number. The inclusion of these observations does not materially affect our results.

[14] In our sample, 6,894 estimates are revised by the time of the final earnings forecast. Of this number, 3,603 are positively biased estimates that are revised downward with 1,443, 1,002, and 1,158 observations ultimately meeting, beating, and missing expectations, respectively. On the other side, 2,860 are negatively biased estimates that are revised upward with 1,350, 938, and 572 observations ultimately meeting, beating, and missing expectations. There are 431 observations that are revised further in the direction of their bias. Of the 177 estimates that are not revised, 73 are positively biased while 104 are negatively biased and there is a positive mean (median) earnings surprise of $0.05 ($0.01).

flow, then analysts should adjust their estimates towards actual earnings as the reporting date approaches for those firms providing option-based pay to outsiders. To test these hypotheses, we run logistic regressions on dummy variables indicating small initial errors, and the meeting, beating, and missing of expectations subsequent to the downward and upward revisions to initial estimates. Ordinary least squares regressions are also estimated on the standard deviation initial and final estimates and upon the accuracy and timeliness of analysts revisions following the intra-year quarterly earnings releases.

4.1.1 Outside Director Stock Options and the Accuracy of Earnings Forecasts

If director stock options encourage the dissemination of anticipated company performance to outside investors, then we expect analysts' estimates to be more accurate for those firms with high option intensity. H1 states that the likelihood of small initial analysts' forecast errors positively relates to the stock price sensitivity of outsiders provided through options. Since many factors influence the precision of analysts' forecast that possibly co-vary with compensation, it is important to control for these factors in a multivariate setting. For example, large or high growth firms often provide more incentive pay to executives and directors. Large firms also receive greater market attention, especially from analysts, and thus firm size could independently affect the accuracy of analysts' forecasts. In addition, controlling for growth firms and innovative firms is important since dynamic firms may be difficult for analysts to accurately predict performance. Firms that are more complex in their operations may also find it beneficial to provide higher stock options to their directors. One would also expect the amount of options awarded to the CEO to relate to analyst expectations. Therefore, we test the relation between director stock options and initial analyst forecasts on the full sample of 7,071 firm year observations using the following logistic regression:

$$\begin{aligned} \textit{Small Initial Error} = {} & a_0 + \beta_1 \textit{Director PPS} + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \\ & \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \beta_8 \textit{CEO is} \\ & \textit{Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \\ & \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year} \end{aligned} \quad (9)$$

dummies + ε

where *Small Initial Error* is a dummy variable equal to one if the initial earnings forecast is within three cents of the actual reported earnings.[15] To see how option intensity affects forecast errors, *Director PPS* represents the three key independent variables of interest (*Individual Outside Director PPS, Audit Committee Director PPS*, and *Outside Director PPS*). Of secondary interest is *CEO PPS* since our predictions for directors may apply to management as well. Also entering the model are control variables for ownership and other firm and governance characteristics. *Director Ownership* is the aggregate percentage ownership held by the outsiders on the board. *CEO Ownership* is the percentage ownership, excluding stock options, held by the CEO. *CEO Age* and CEO *Tenure* are the age and years held in office for the CEO, respectively. *Board size* is the number of directors on the board. *CEO Chairman* is a dummy equal to one when the CEO holds the position of the chair of the board and zero otherwise. *Percent Outside Directors* is the number of independent directors as a fraction of total directors on the board, and *Outsiders on Audit* is the fraction of outside directors on the audit committee. *Number of Analysts* is the total number of analysts following the firm during the fiscal year.

[Table 2]

Results presented in the first model of Table 2 suggest that boards structured with outsiders compensated with stock options lead to more accurate initial analysts' forecasts. The point estimate of 0.157 on *Outside Director PPS* is positive and significant at better than the 0.01 level. The marginal effects imply that a one-standard deviation increase in the directors' option sensitivity leads to an 8% increase in the likelihood of having a small initial error.[16] Given that the unconditional probability of a small error is only 14.8%, this represents 54.4% improvement in forecast accuracy. *CEO PPS* however, is insignificant, with marginal effects implying only a

[15] Alternatively, we define *Small Initial Error* as whether the initial forecast is within ±5% of the actual EPS number. The estimates on our director PPS variables are unchanged in both sign and significance.
[16] Given a marginal effect of 0.016616 and ln(1+Std Dev of Outside Director PPS) = 4.845843, this one-standard deviation move equals 0.016616 x 4.845843 = 0.0805193.

0.2% improvement in forecast accuracy. This suggests that while awarding directors higher levels of option pay increases the accuracy of analysts' initial earnings estimates, CEO option pay has little impact.

Positive *CEO Tenure* implies that analysts perhaps are able to infer more from CEOs with a longer track record and from larger firms. The sign on *Total Capital* is consistent with Khanna, Palepu, and Srinivasan (2004) who document a positive association between market capitalization and transparency. Finally, *Percentage Outside Directors* is negative and significant. This result suggests that while increasing total outsider option pay increases the likelihood of a small error, the impact is diminished as this sensitivity is spread over more directors.

In columns 2 and 3, we re-estimate the above regression replacing *Outside Director PPS* with *Audit Committee Director PPS* and *Individual Outsider PPS*. Consistent with aggregate outsider sensitivity, both measures of option intensity continue to be positive and significant, implying that individual sensitivity and that of the audit committee members also increases the likelihood of small initial forecast errors. *CEO Tenure* remains significantly positive; *R&D* continues to be negative and significant.

Overall, the results presented in Table 2 lend supporting evidence to the hypothesis that increasing outsider sensitivity to stock price with options increases the likelihood of small initial forecast errors.

4.1.2 Outside Director Stock Options and the Variability of Earnings Forecasts

An alternative approach to assessing the information flow from outside directors is to measure the variance of analysts' forecasts for a particular firm in a given period. If director stock options reduce information asymmetry between investors and corporate insiders, then there should be more agreement among analysts regarding performance forecasts. H1 also states that disparities among analysts' estimates are decreasing in outside director option sensitivity. To test this hypothesis we use the above model in the OLS form, replacing the dependent variable

with the standard deviation of initial estimates and the standard deviation of the estimates from the final analyst forecast. The key independent variables and control variables are as defined in the previous regression model.

$$\begin{aligned} \textit{Std Dev of Est} = {} & a_0 + \beta_1 \textit{Director PPS} + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \\ & \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \beta_8 \textit{CEO is} \\ & \textit{Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \\ & \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year} \\ & \textit{dummies} + \varepsilon \end{aligned} \quad (10)$$

Std Dev of Est takes on one of two values: the standard deviation of initial estimates from the first analyst forecast period prior to the earnings announcement (*Std Dev of Initial Est*), and the standard deviation of estimates from the final analyst forecast period prior to the earnings announcement (*Std Dev of Final Est*).[17] Hypothesis 1 is supported if the standard deviations of forecast estimates are decreasing in *Individual Outside Director PPS*, *Audit Committee Director PPS*, and *Outside Director PPS*.

[Table 3]

Regression results for *Std Dev of Initial Est* are provided in Panel A of Table 3. Consistent with the predictions of Hypothesis 1, awarding higher proportions of stock options to outside directors significantly decreases the standard deviation of the initial forecast; CEO sensitivity has no significant impact. A one-unit increase in outsider option intensity implies a reduction of this dispersion by $0.0.09. More seasoned CEOs and audit committees comprised of outsiders likewise significantly decreases the variance of initial forecasts. Not surprising, the coefficient on *R&D* predicts that increasing spending on research and development creates more disparity among forecast as analysts have difficulty determining the implications of new projects. Replacing *Outside Director PPS* with *Audit Committee Director PPS* in column 2 and *Individual Outside Director PPS* in column 3, reveals that *Std Dev of Initial Est* is also decreasing in the audit members' and the individual proportion of outsider option pay.

[17] The results for director PPS are unchanged if we normalize the standard deviation by the absolute value of the actual EPS number.

Table 3, Panel B replicates the Panel A regression on *Std Dev of Final Est. Outside Director PPS*, *Audit Committee Director PPS*, and *Individual Director PPS* are each negative and significant. The estimates imply that a one-unit increase in outsider director sensitivity is associated with a $0.04 decrease in estimate volatility. Thus, increased option pay to outsiders decreases the variance of estimates for the final analyst forecast period as well. This result on final forecast estimates is perhaps more interesting than the variance of the initial forecasts, given they contain the final revisions made prior to the release of the actual earnings. Whether the CEO is incentivized with high levels of stock options appears irrelevant as the CEO pay variables are insignificant in both regressions.

4.2 Outside Director Stock Options and Expectations Management

Perhaps of greater interest is how analyst forecasts evolve over the estimation period. During the period leading to the actual reporting of earnings, analysts receive information about the ability of firms to achieve earnings targets. Thus, analysts are expected to adjust firm estimates as the actual reporting date draws near and new information is disseminated. In addition, if directors are motivated by stock options to guide outside investors regarding the real potential of the firm, then we should observe a positive relation between director incentive compensation and the probability of accurate adjustments. That is, forecasts that are initially biased should be revised resulting in final estimates that are closer to actual reported earnings. To further examine the role stock options play in incentivizing directors to disseminate information to outside investors, we examine revisions in initially biased forecasts and the ultimate meeting, beating, and missing of earnings expectations and explore the mechanism for which this information is transmitted.

[Figure 2]

4.2.1 Mechanism for Performance Dissemination

While the evidence presented in Tables 2 and 3 suggests that compensating outside directors with stock options encourages transparency, it remains unclear what the mechanism is for this transmission of information. To gain further understanding of this process, we examine the evolution of the earnings forecasts by each analyst for a given firm for the twelve months leading up to the annual EPS announcement. In Figure 2, we plot the median absolute forecast error of the analyst estimates for the firms in our sample and bifurcate the estimates by whether the issuing analyst is covering a firm whose directors exhibit high or low pay-performance sensitivity. *High PPS* (*Low PPS*) is defined as having an *Outside Director PPS* value greater or equal to (less than) than the median of all firms listed in Execucomp. We also compute the percentage of the initial forecast error corrected with each revision as:

$$Pct\ Error\ Corrected = \frac{|Initial\ Forecast\ Error| - |Forecast\ Error_t|}{|Initial\ Forecast\ Error|} \quad (11)$$

where *Initial Forecast Error* is the error from the first estimate of the fiscal year and *Forecast Error*$_t$ is the error remaining after the most recent revision. The median value for all analysts, split by director PPS, is depicted in the second chart.

Not surprisingly, both sets of analysts improve their forecasts throughout the year and over 70 percent of the initial forecast errors are corrected by year-end. However, analysts coving firms with high PPS boards have forecasts that initially more accurate and they remain so until the actual release. They also appear to correct a larger percentage of their forecast errors during the year.[18] Interestingly, there appears to be sharp improvements in the forecast errors, particularly for those covering high PPS firms, at 3, 6, and 9 months preceding the annual earnings release. These improvements likely coincide with the quarterly earnings releases and conference calls. Management often uses these releases to offer earnings guidance for the coming year [Frankel, Johnson, and Skinner (1999)].

[18] We note that, since analysts covering high PPS firms have smaller initial errors, this measure is biased against the high PPS group since they have less error to correct throughout the year all else equal.

If the analysts are updating their revisions due to enhanced disclosure at the quarterly conference calls, then one would expect that they should more accurately revise their estimates shortly after the intra-year quarterly earnings releases. To more formally test this, for each firm in our sample we identify the exact quarterly EPS release dates and compute the average number of days it takes each analyst to issue their first revision following that date (*Days Until Revision*). We regress this upon our key option sensitivity measures with the following model:

$$\begin{aligned} \textit{Days Until Revision} = {} & a_0 + \beta_1 \textit{Director PPS} + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \\ & \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \beta_8 \textit{CEO is} \\ & \textit{Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \\ & \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year} \\ & \textit{dummies} + \varepsilon \end{aligned} \quad (12)$$

To test the accuracy of these new estimates, we also analyze the average percentage initial forecast error corrected (*Pct Error Corrected*) upon the issuance of the revision with the following model:

$$\begin{aligned} \textit{Pct Error Corrected} = {} & a_0 + \beta_1 \textit{Director PPS} + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \\ & \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \beta_8 \textit{CEO is} \\ & \textit{Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \\ & \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year} \\ & \textit{dummies} + \varepsilon \end{aligned} \quad (13)$$

[Table 4]

In Panel A of Table 4, all three director sensitivity measures are negatively related to the time it takes for analyst to issue a revision. The parameter estimates imply that analysts issue their revisions 2.4 days sooner for each one standard deviation increase in *Outside Director PPS*. A similar, but albeit weaker, effect is also observed for CEOs. If revising analysts are responding to information from the quarterly earnings releases, this implies that compensating directors with options encourages better earnings guidance. The results in Panel B support this contention. Paying directors in stock options is associated with more accurate earnings revisions immediately following the intra-year quarterly EPS releases. Estimates imply that increasing *Outside Director*

PPS by one standard deviation is associated with a 15.6% improvement in forecast accuracy at the quarterly releases. Unlike the results in Panel A, we do not observe a similar effect for CEO stock options.

Thus, it appears that directors compensated with stock options influence management to issue more timely and accurate earnings guidance. This is consistent with NYSE listing standard requirements which compel the audit committee to review all communication with analysts at the earnings releases[19] and prior work documenting that the board influences the quality of management's performance disclosure [Klein (2002) and Xie, Davidson, and DaDalt (2003)].

4.2.2 Outside Director Stock Options and Overly Optimistic Earnings Forecasts

Hypothesis 2 predicts a positive association between outside director stock options and the probability a firm with positively biased estimates experiences a downward revision. To test this conjecture we isolate firms with downward revisions to initial positive forecast biases and examine the association between outside director option pay and meeting reported earnings. This hypothesis is supported if higher option pay sensitivity increases the likelihood of meeting expectations. Hence, we run the following logistic regression.

$$\begin{aligned} &\textit{Downward and (Meet, Beat, Miss)} = a_0 + \beta_1\, \textit{Director PPS} + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \\ &\beta_8 \textit{CEO is Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14}\, \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year dummies} + \varepsilon \end{aligned} \quad (14)$$

The dependent variable, *Downward and Meet*, is an indicator variable equal to one if analysts' initial forecasts are revised downward such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. Table 5, Panel A reports results for the 3,603 firm year observations that experienced a downward revision

[19] Under NYSE listing standards, the audit committee must "discuss the company's earnings press releases, as well as financial information and earnings guidance provided to analysts and rating agencies" and "assist board oversight of the integrity of the company's financial statements" [NYSE Listing manual, Section 303A].

subsequent to receiving a positively biased initial earnings estimate. Of the 3,603 downward revisions, 1,443 end up meeting analysts' expectations.

[Table 5]

Results on *Outside Director PPS* are positive and significant, implying that conditional on receiving a positively biased initial forecast, the likelihood of a downward revision to meet expectations is increasing in the option sensitivity of outside directors. Parameter estimates imply that a one standard deviation increase in PPS results in a 24.5% increase in this likelihood, which represents a 61% improvement in the ability of the firm to manage overly optimistic expectations to their true level. We can infer, however, that the impact is lessened as aggregate option sensitivity is dispersed over more outsiders by the estimate on percent independent. *CEO PPS* is positive and significant, suggesting that CEOs incentivized with options are likewise motivated to disseminate information leading to the ultimate meeting of forecasts. Columns 2 and 3 reveal that *Audit Committee Director PPS* and *Individual Outside Director PPS* are likewise positive and significant at better than the 0.01 level. Similar to column 1, *CEO PPS* positively and *R&D* negatively relate to downward revisions that ultimately meet analyst forecasts. Thus, Hypothesis 2 is supported as increasing option pay to outside directors appears to increase the likelihood of information flow that allows analyst to walk down forecasts to meet actual earnings. Also supported, but not directly hypothesized, is the idea that CEO option pay is influential to the walking down of earnings to meet.

Panel B replicates Panel A, but instead of *Downward and Meet* as the dependent variable, we investigate the impact of option pay on beating following a downward revision. *Downward and Beat* takes on unity if the initial forecast is revised downward and the actual earnings significantly beat expectations (EPS Actual - EPS Est > $0.03). Although not directly hypothesized, this test is important since it sheds light on the practice of expectations manipulation by directors to artificially inflate stock price through positive earnings surprises. If stock option pay incentivizes

directors to accurately circulate information, we should not expect options to increase the likelihood of over assertion of influence to significantly beat. The base sample for this test is still the 3,603 downward revisions. Of the 3,603 revisions, we find that 1,002 end up beating final estimates. Regression results reveal that all three director PPS measures negatively relate to *Downward and Beat*. This result implies that director options do not lead to under-selling positive information or over-selling negative information for the purpose of beating earnings.

Panel C replicates these tests on *Downward and Miss*. *Downward and Miss* is a dummy variable equal to one if the analysts' initial forecasts are revised downward and the actual earnings number still misses expectations (EPS Actual - EPS Est < $0.00). There are 1,158 initial estimates that are revised down, but still miss actual earnings. Panel C results reveal that *Outside Director PPS, Audit Committee Director PPS*, and *Individual Outside Director PPS* significantly decrease the likelihood of receiving a downward revision that falls short of actual earnings. The coefficient on *CEO PPS* likewise indicates that CEO stock options also decrease the likelihood of ultimately missing estimates.

Collectively, the results of Table 5 suggest that conditional on overly optimistic initial earnings estimates, incentivizing outside directors with stock options increases the likelihood of downward revisions to meet earnings, and decreases the likelihood of downward revisions that still fall short of actual earnings. However, director options discourage the practice of manipulating information to significantly beat estimates.

4.2.3 Outside Director Stock Options and Pessimistic Earnings Forecasts

The previous tests suggest that, when faced with an upward bias in analysts' estimates, outside director stock option compensation is associated with downward adjustments towards actual earnings as the report date approaches. Perhaps a more informative scenario is presented with the case of when analysts are overly pessimistic about future earnings and the company is pre-disposed to beat expectations. Hypothesis 2 additionally argues that if outside director stock

options promote information flow to investors, initial earnings estimates that are biased low should also lead to upward revision to meet earnings. To examine this argument, we follow the logic of the previous tests and identify firms with upward revisions to negatively biased analysts estimates and repeat the tests in Table 6. Thus, by construction, this subsample isolates the pessimistic estimates that, if no revisions are made, the firm will most likely exceed expectations. Using the model below, we explore how options relate to the willingness of directors and the CEOs to provide information to investors that aids in transparency, but ultimately makes it more difficult to meet expectations.

$$\begin{aligned} \textit{Upward and (Meet, Beat, Miss)} = {} & a_0 + \beta_1 \textit{ Director PPS } \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \\ & \beta_8 \textit{CEO is Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{ Number of Analysts} + \textit{Industry dummies} + \textit{Year dummies} + \varepsilon \end{aligned} \quad (15)$$

Upward and Meet, is a dummy variable that equals one if the analysts' initial forecasts are revised upward such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. Hypothesis 2 is supported if the likelihood of meeting earnings increases in the level of outside director option pay sensitivity. Table 6 presents these results.

[Table 6]

There are 2,860 upward revisions; 1,350 of these end up meeting, 938 beating, and 572 end up missing actual earnings. Consistent with the argument that outside director stock options promote information management, *Outside Director*, *Audit Committee Director PPS,* and *Individual Outside Director* are each positive and significant. The parameter estimates imply that a one standard deviation increase in outside director PPS results in a 11.3% increase in the likelihood that analysts will revise their estimates upward such that the firm meets expectations. This represents an 24% improvement in the ability of the firm to adjust pessimistic expectations up to their true level. The coefficient on *CEO PPS* implies that executive stock options do not provide adequate incentives to induce adjustment of expectations.

Contrasting these results with the *Downward and Meet* in Table 5, we see that incentivizing the CEO with stock options induces behavior to manage analyst expectations only when the firm is initially set to miss expectations; however stock options to outsiders promotes information management when the firm is set to either meet or beat. As in the previous models, *Percent Outsider Directors* takes on the same sign as *Outside Director*, suggesting that spreading out total option sensitivity to more directors reduces the impact. Thus, Hypothesis 2 is supported.

Panel B reports the results on *Upward and Beat*. *Upward and Beat* takes on unity when initial forecasts are revised upward and the actual earnings significantly beat expectations (EPS Actual - EPS Est > \$0.03). As previously argued, this test offers insight on expectations manipulation to artificially inflate stock price through positive earnings surprise. If stock option pay incentivizes directors to accurately disseminate information, we should not expect option pay to increase the likelihood of over assertion of influence to significantly beat. Indeed, option pay does not correlate with information manipulation as all three measures, while negative, are statistically insignificant We take this as evidence that option pay to outside directors promotes the monitoring role of the board and does not lead to collusion with management.

Panel C replicates these tests on *Upward and Miss*. *Upward and Miss*, is a dummy variable that equals one if the analysts' initial forecasts are revised upward and the actual earnings miss expectations (EPS Actual - EPS Est < \$0.00). Consistent with the previous models, *Outside Director PPS, Audit Committee Director PPS,* and *Individual Outside Director PPS* decrease the likelihood of receiving an upward revision that falls short of actual earnings.

Overall, results in Tables 2 through 5 support the argument that increasing outside director incentives through stock options incentivizes directors to work to disseminate better information regarding the firm. This perception is reflected in initial forecast errors that are smaller, contain less variance, and have a greater probability of being accurately revised to meet of actual earnings. In contrast, we do not find this effect consistently for CEO stock options.

4.3 Director Stock Options and Earnings Management

The results in the previous section advocate that directors paid in the form of stock options tend to be motivated to facilitate the transfer of information to outside investors. Further, their effort to do so is not hindered by the CEO's structural influence as chair of the board or the CEOs long tenure. In this section, however, we examine whether stock options to directors aid in converging their interests with those of CEOs and motivate them to involve in earnings management in order to meet market thresholds. Our main argument is that achieving such targets promises high financial benefits to both management and directors and hence, stock options present an incentive for directors to compromise on their fiduciary responsibility. More formally, Hypothesis 3 states that earnings management following biased initial estimates is positively associated with the option sensitivity of outside directors. We test these hypotheses with the following OLS regression.

$$\begin{aligned} \textit{Earnings Management} = {} & a_0 + \beta_1 \textit{Director PPS} + + \beta_2 \textit{CEO PPS} + \beta_3 \textit{Director Ownership} + \beta_4 \textit{CEO Ownership} + \beta_5 \textit{CEO Age} + \beta_6 \textit{CEO Tenure} + \beta_7 \textit{Board Size} + \\ & \beta_8 \textit{CEO is Chairman} + \beta_9 \textit{Percent Outside Directors} + \beta_{10} \textit{Outsiders on Audit} + \beta_{11} \textit{Total Capital} + \beta_{12} \textit{Market-to-Book} + \beta_{13} \textit{R\&D} + \beta_{14} \textit{Number of Analysts} + \textit{Industry dummies} + \textit{Year dummies} + \varepsilon \end{aligned} \quad (16)$$

The full sample of 7,071 firm year observations are split into those that experienced positively and negatively biased initial earnings estimates. Positively biased estimate (negatively biased estimate) is defined as one in which the initial analyst forecast is greater than (less than) the actual reported. The dependent variable in both panels, *Earnings Management*, is defined as discretionary current accruals using the Modified Jones (1991) model as computed by Dechow, Sloan, and Sweeney (1995). The key independent variables of interest are *Outside Director PPS* and *Individual Outside Director PPS*; all control variable as previously described.

Table 7 reports regression results for our 3,838 and 3,233 sample firm year observations in Panels A and B that experienced positively biased and negatively biased initial earnings estimates, respectively.

[Table 7]

Panel A offers no support for the hypothesis that outside director stock options relate to earnings management following positively biased estimates. Outside Director and Individual Outside Director take on the opposite sign of that which is hypothesized, and neither are significant. Thus, Hypothesis 3 is not supported. However, consistent with prior studies, we show that CEO PPS is positively associated with earnings management. The point estimates of 0.0227, 0.0211, and 0.0222 are each significant with p-values between 0.03 and 0.04for the three models. These estimates imply that a standard deviation increase in CEO option sensitivity is associated with an increase in discretionary accruals amounting to 14% of assets, suggesting that the firm is managing earnings upwards to meet expectations.

Panel B provides results for the 3,233 sample firm years that begin the reporting period with initially negatively biased earnings estimates. Consistent with Panel A, we continue to find no significant association between outside director option incentive pay and the use of discretionary accruals. Thus, no evidence is found in support of Hypothesis 3. We do, however, find weak evidence that CEO option sensitivity is associated with managing earnings downward in this scenario. *CEO PPS* is negatively related to our earnings management measure, but only in the first model and only at the 10 percent level. This is consistent with the notion of conserving earnings power for future periods when the firm may face the risk of missing expectations.

Collectively, we interpret the results of Tables 2 through 6 to suggest that providing outside directors with stock options promotes the interest of shareholders. Paying directors stock options incentivizes them to convey information regarding the firm to analysts and outside investors; however, unlike awarding CEOs with options, it does not increase agency costs by increasing earnings management (e.g. Burns and Kedia, 2006).

[Table 8]

5. Additional Tests

5.1 Firm Compensation Policy?

As previously described, the level of option-based compensation awarded to outside directors in many cases could simply be a function of the overall compensation policies of the firm. While including *CEO PPS* in the above models should control for this effect, we employ firm fixed regressions to ensure robustness. Although this technique is expensive in terms of statistical power since we are effectively including an indicator variable for each firm in our sample, it will explicitly control for any company-wide compensation policies. Hence, in Table 8 we replicate all the primary tests on the 7,071 sample firm year observations using firm fixed effects regression models of director option pay sensitivity. Models ones through three test the relation of outside director pay and information disclosure, while model 4 tests the association of director pay and earnings management. Consistent with the results presented in section four, all coefficients on *Outside Director PPS* remain significant in the directions hypothesized. Also consistent with our prior findings, *Outside Director PPS* is not related to the likelihood of earnings management.

[Table 9]

5.2 Reverse Causality?

Another potential explanation for our findings is that of reverse causality. For instance, it could be that option grants are made opportunistically in response to pessimistic analyst forecasts that the firm knows it likely will end up beating. The ultimate beating of the forecast would increase the value of these option grants that were initially at-the-money. In Table 9 we address this potential concern by presenting results where the current fiscal year grant is excluded for our outside director option sensitivity variable. Thus, the option portfolio measured here is fixed prior to the formulation of the analyst estimates. We present this variable as *Outside Director 4-year PPS*. In each of the four regressions for information management *Outside Director 4-year PPS* is significant in the hypothesized direction, further supporting our initial finding. Also

consistent with prior results, *Outside Director 4-year PPS* does not significantly relate to earnings management.

5.3 Reg FD and SOX

Several important regulatory initiatives were implemented during our sample period that could influence incentives to disclose information to shareholders. On August 1, 2000 the SEC adopted *Regulation FD* to address the issue of selective disclosure of material private information to market participants (i.e. analysts, fund managers, etc). Subsequent to its implementation, any disclosure of nonpublic material information must be done so in a public fashion with no favor shown to any individual or entity. The intent of this rule was to promote the fair disclosure of information and increase transparency. However, some have argued that rather than limiting selective disclosure to some parties, it has limited disclosure altogether. If the Reg FD works as intended, then it might mitigate the need for boards to be incentivized with stock options to be more transparent. The *Sarbanes-Oxley Act of 2002 (SOX)*, which was enacted in July of 2002, also sought to improve company disclosure and mitigate fraud. Furthermore, SOX places criminal penalties for violations of the act, particularly those relating to manipulation of the financials. As with Reg FD, one might expect the enhanced disclosure requirements to mitigate the necessity of options-based incentives. Due to the potential criminal penalties, SOX may play an additional role when it comes to the management of earnings.

In unreported tests, we investigate this issue by creating indicator variables for whether the sample observation occurs after the implementation of Reg FD or the passage of SOX. In separate models, we interact these indicators with our measures of director and CEO pay-for-performance sensitivity (Outside Director PPS and CEO PPS) while maintaining our battery of controls and industry / year fixed effects for each of the tests in Table 9. We find no evidence consistent with the notion that Reg FD or SOX alters the incentive effects of stock option sensitivity upon the accuracy or variance of earnings estimates. We also find no significant

change in the likelihood of analyst revisions. We do, however, find that SOX reduces the propensity for options to induce CEOs to manage earnings. An F-test of the joint effect between CEO PPS and Post-SOX is insignificant, indicating that CEO stock options no longer significantly increase earnings management after the passage of SOX.

6. Conclusion

There is a vast literature dealing with incentives provided through management compensation and the resulting agency costs that often occur. Several theories have been advanced, but the answer remains elusive. In this paper, we add to this literature by examining the incentives and costs of compensating outside directors with stock options. In particular, we propose that providing outside directors with stock options can lead to contradicting effects on the reporting process. On the one hand, by aligning their interests with those of shareholders, directors become more inclined to disclose relevant information to investors. On the other hand, stock options increase directors' compensation sensitivity to firm performance and thus may motivate them to collude with management to present the firm in its best shape.

To test the first conjecture we study the role stock options have in incentivizing outside directors to engage in expectations management. If stock option-based compensation provides incentive for directors to fulfill this duty, we would expect better information flow to the outside investor and consequently more accurate earnings forecasts.

We therefore test the association of outside director stock option pay with small initial errors, and the meeting, beating, and missing of downward and upward revisions to initial estimates. Results from this study support the notion that outside directors receiving stock options fulfill their role in disseminating information.

Results presented in this study show that incentivizing outsiders through options increases the accuracy and decreases the variance of both initial and final earnings estimates,

even when CEO option pay has little to no impact. We show that analysts covering firms with option intense boards respond more quickly and accurately with earnings revisions immediately following the intra-year quarterly earnings releases. This implies that outsiders compensated with stock options encourage management to issue better earnings guidance. An examination of revisions in forecast errors further indicates director option pay increases the likelihood of both a downward revision to positively biased estimates and an upward revision to negatively biased estimates to meet the actual reported earnings. Analysis of the CEO, however, reveals that high levels of CEO options only increases the likelihood downward revisions to meet; no evidence is found consistent with CEO performance pay increasing the likelihood of walking up expectations.

To test whether director stock options encourage self-dealing, we focus on earnings management and find that director stock option sensitivity is not significantly related to the use of discretionary accruals. This result does not support the notion that director stock options promote collusive effort by directors and managers in managing earnings to meet market thresholds. Thus, the benefits of better information flow to investors from providing director stock options are not offset by significantly increased agency costs.

This study contributes to the existing literature which documents the effectiveness of director stock option grants in mitigating the agency problem between shareholders and managers (Yermack, 2004 and Vafeas, 1999), and provides evidence that director stock options are positively related to increased disclosure regarding firm performance. Options based compensation for corporate directors reduces the information asymmetry that exists between shareholders and managers, reducing the riskiness of an investment in the firm. Thus, supporting the argument in Fama and Jensen (1983) and Harford (2003) that directors should earn modest levels of financial benefits, we show at the current modest levels director stock options do not generate high agency costs like CEO stock options.

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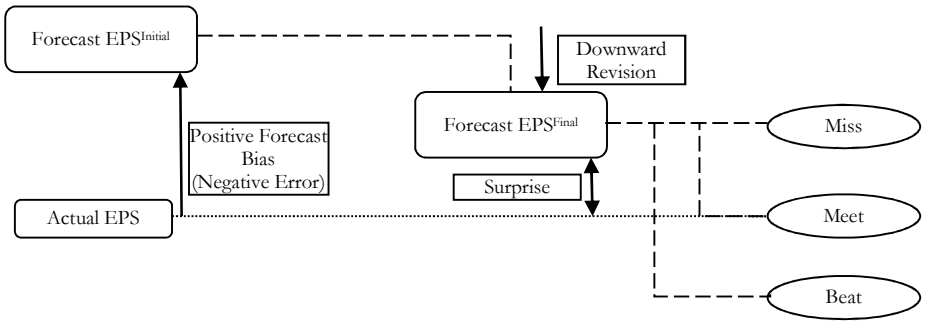
Figure 1
Analysts' Earnings Forecasts and Expectations Management

Example of Optimistic Analyst EPS Expectations



Example of Pessimistic Analyst EPS Expectations

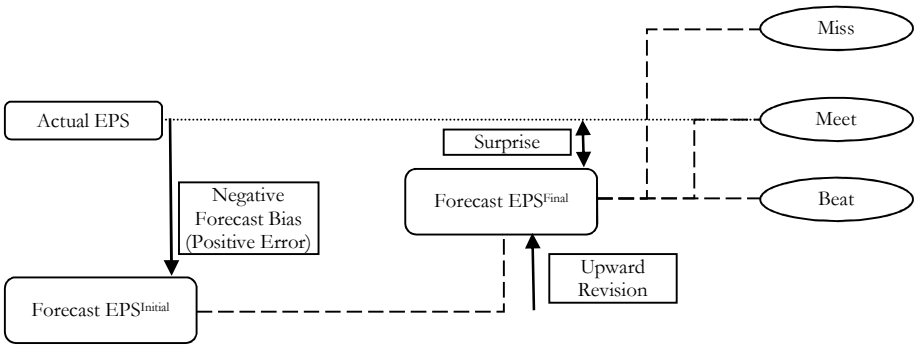
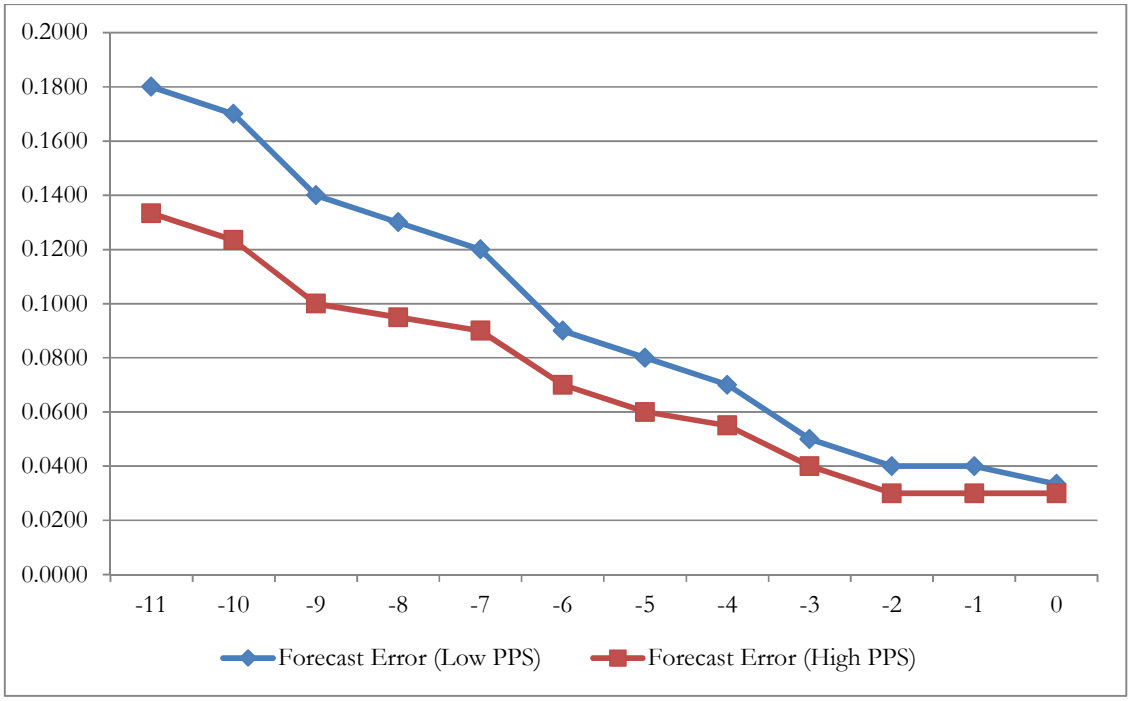


Figure 2
Analysts' Forecast Errors for the Twelve Months Preceding the EPS Announcement

Median Analyst Forecast Error



Median Percentage of Analysts' Initial Forecast Error Corrected from Revisions

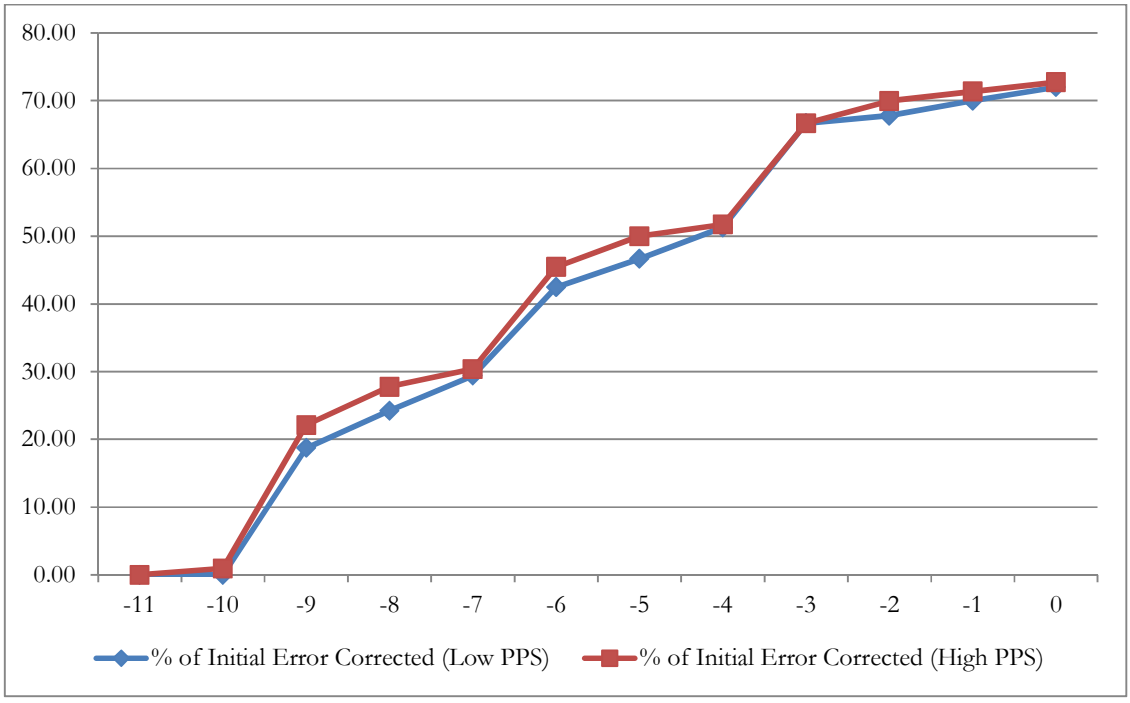


Table 1
Summary Statistics

This table presents summary statistics for our 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. *Total Capital* is the total capitalization of the firm in $B and is defined as the market value of equity plus the book value of debt. *Market-to-Book* is the market capitalization of common equity divided by its book value. *R&D* is research and development expense plus advertising expense normalized by total assets. *Outside Director Pay in Options* is the Black-Scholes value of the current option grants to each independent director in the current fiscal year in $000s. *Outside Director Total Pay* is the sum of the annual retainer, meeting fees, stock grants, and option grants awarded to each outside director in the current fiscal year in $000s. *Individual Outside Director PPS* is the sensitivity of the value of a representative individual outside director's five-year option portfolio to a 1% change in stock price as computed by Core and Guay (1999). *Audit Committee Director PPS* represents the cumulative PPS for all of the outside directors on the audit committee. *Outside Director PPS* represents the cumulative PPS for all of the outside directors on the board. *Outside Director Ownership* is the aggregate percentage ownership of the common stock held by the outsiders on the board. *CEO Pay in Options* is the Black-Scholes value of the current option grants to the CEO in $000s. *CEO Total Pay* is the sum of the salary, bonus, options, restricted stock, and other perquisite compensation paid to the CEO in the current fiscal year in $000s. *CEO PPS* is the sensitivity of the CEO's five-year option portfolio to a 1% change in stock price. *CEO Ownership* is the percentage of common stock, excluding stock options, held by the CEO. *CEO Age* and *CEO Tenure* are the age and years held in office for the CEO in years, respectively. *CEO is Chairman* is a dummy that equals 1 when the CEO holds the position of the chair of the board and zero otherwise. *Board size* is the number of directors on the board. *Percent Outside Directors* is the number of independent directors as a fraction of total directors on the board. *Outsiders on Audit* is the fraction of outside directors on the audit committee. *Number of Analysts* is the total number of analysts listed in I/B/E/S following the firm. *Forecast Error* is the difference between the initial earnings per share (EPS) forecast and the actual reported earnings. *Positive Bias* is a dummy variable that equals '1' if analysts' initial forecasts exceed actual reported earnings and zero otherwise. *Earnings Revision* indicates whether there is either an upward or downward revision in the EPS estimates. *Std Deviation of EPS Estimate (First)* and *Std Deviation of EPS Estimate (Last)* are the standard deviations of the EPS estimates for the first and last I/B/E/S statistical forecast periods, respectively. *Total Current Accruals* and *Discretionary Current Accruals* are the differences between cash and reported earnings as defined by Dechow, Sloan, and Sweeney (1996) are detailed in equations (6) and (8) in the text.

Variable	**Mean**	**Std Dev**	**Q1**	**Median**	**Q3**
Firm Characteristics					
Total Capital	8.46	24.37	0.82	2.02	5.68
Market-to-Book	4.86	68.12	1.68	2.54	4.08
R&D	0.05	0.07	0.00	0.03	0.07
Outside Director Incentives					
Individual Outside Director Pay in Options	185.04	435.21	15.89	62.32	180.19
Individual Outside Director Total Pay	250.88	469.90	73.46	129.21	250.19
Individual Outside Director PPS	11.33	20.65	1.98	5.11	12.15
Audit Committee Director PPS	30.88	55.90	5.64	14.16	33.46
Outside Director PPS	65.30	126.21	11.52	28.82	69.07
Outside Directors Ownership	1.17%	3.72%	0.15%	0.36%	0.86%
CEO Incentives					
CEO Pay in Options	3,055.22	11,342.69	195.67	986.42	2,761.09
CEO Total Pay	5,328.72	11,891.97	1,363.99	2,809.39	5,668.77
CEO PPS	230.75	501.67	36.10	100.64	243.38
CEO Ownership	2.11%	5.43%	0.08%	0.29%	1.24%
Governance Characteristics					
CEO Age	55.20	7.11	50.00	55.00	60.00
CEO Tenure	7.57	6.99	2.67	5.42	10.16
CEO is Chairman	0.61	0.49	0.00	1.00	1.00
Board Size	9.01	2.31	7.00	9.00	11.00
Percent Outside Directors	68.31%	16.40%	57.14%	71.43%	81.82%
Outsiders on Audit	91.02%	18.01%	100.00%	100.00%	100.00%
Analyst Estimates					
Number of Analysts	10.77	7.53	5.00	9.00	15.00
Forecast Error	-0.25	3.88	-0.24	-0.01	0.10
Positive Bias	0.54	0.50	0.00	1.00	1.00
Earnings Revision	0.97	0.16	1.00	1.00	1.00
Std Deviation of EPS Estimate (First)	0.19	3.69	0.02	0.04	0.09
Std Deviation of EPS Estimate (Last)	0.07	1.36	0.01	0.02	0.03
Earnings Management					
Total Current Accruals	-0.05	0.12	-0.09	-0.05	0.00
Discretionary Current Accruals	0.00	0.75	-0.13	0.01	0.14

Table 2
Director Pay-for-Performance Sensitivity and Analysts' Initial Forecast Errors

This table reports results from logistic regression which examine the relation between director incentive compensation and analysts' forecast errors for our 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. The dependent variable, *Small Initial Error*, is a dummy variable that equals '1' if the initial EPS forecast is within +/- $0.03 of the actual reported earnings number. The key independent variables of interest in each panel are *Individual Outside Director PPS, Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

	(1)		(2)		(3)	
	Small Initial Error		Small Initial Error		Small Initial Error	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-2.6891	0.93	-2.6386	0.93	-2.7880	0.93
Outside Director PPS	0.1574	0.00				
Audit Committee Director PPS			0.1623	0.00		
Individual Outside Director PPS					0.1542	0.00
CEO PPS	0.0006	0.98	0.0021	0.94	0.0087	0.75
Director Ownership	0.0021	0.81	0.0024	0.78	0.0030	0.73
CEO Ownership	-0.0083	0.26	-0.0083	0.26	-0.0084	0.26
CEO Age	-0.0050	0.35	-0.0051	0.34	-0.0054	0.32
CEO Tenure	0.0124	0.03	0.0126	0.03	0.0136	0.02
Board Size	0.0085	0.61	0.0165	0.32	0.0187	0.27
CEO is Chairman	0.0205	0.79	0.0156	0.84	0.0111	0.88
Percent Outside Directors	-0.0056	0.04	-0.0037	0.16	-0.0036	0.18
Outsiders on Audit	-0.0030	0.17	-0.0049	0.03	-0.0025	0.24
Total Capital	0.0017	0.23	0.0017	0.24	0.0016	0.27
Market-to-Book	-0.0002	0.80	-0.0002	0.80	-0.0002	0.80
R&D	-1.2899	0.03	-1.2490	0.03	-1.1851	0.04
Number of Analysts	0.0001	0.99	0.0002	0.97	0.0011	0.86
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Small Initial Error = 1	1,045		1,045		1,045	
Small Initial Error = 0	6,026		6,026		6,026	
N	7,071		7,071		7,071	

Table 3
Director Pay-for-Performance Sensitivity and the Variability of Analyst Forecasts

This table reports results from OLS regression tests of whether director incentive compensation relates to the variability of analysts' forecasts for our 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. The dependent variable in Panel A, *Std Dev of Inital Est*, is the standard deviation estimates from the first analyst forecast period prior to the earnings announcement. The dependent variable in Panel B, *Std Dev of Final Est*, is the standard deviation of the estimates from the final analyst forecast period prior to the earnings announcement. The key independent variables of interest in each panel are *Individual Outside Director PPS*, *Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

Panel A: Standard Deviation of Initial EPS Estimates

	(1) Std Dev of Initial Est		(2) Std Dev of Initial Est		(3) Std Dev of Initial Est	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	1.9368	0.09	1.9259	0.09	2.0719	0.07
Outside Director PPS	-0.0855	0.04				
Audit Committee Director PPS			-0.0882	0.04		
Individual Outside Director PPS					-0.1279	0.02
CEO PPS	-0.0101	0.77	-0.0111	0.75	-0.0039	0.91
Director Ownership	-0.0049	0.67	-0.0050	0.66	-0.0051	0.66
CEO Ownership	-0.0024	0.79	-0.0024	0.79	-0.0022	0.81
CEO Age	0.0218	0.00	0.0218	0.00	0.0215	0.00
CEO Tenure	-0.0134	0.07	-0.0135	0.06	-0.0135	0.06
Board Size	0.0236	0.27	0.0192	0.37	0.0143	0.51
CEO is Chairman	-0.1166	0.21	-0.1140	0.22	-0.1174	0.21
Percent Outside Directors	0.0022	0.53	0.0012	0.73	0.0009	0.79
Outsiders on Audit	-0.0068	0.02	-0.0058	0.05	-0.0070	0.02
Total Capital	-0.0013	0.52	-0.0013	0.53	-0.0012	0.57
Market-to-Book	-0.0001	0.87	-0.0001	0.87	-0.0001	0.87
R&D	15.6246	0.00	15.6023	0.00	15.6568	0.00
Number of Analysts	-0.0207	0.00	-0.0209	0.00	-0.0206	0.00
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	7,071		7,071		7,071	

Panel B: Standard Deviation of Final EPS Estimates

	(1) Std Dev of Final Est		(2) Std Dev of Final Est		(3) Std Dev of Final Est	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0.2496	0.56	0.2475	0.57	0.3066	0.48
Outside Director PPS	-0.0367	0.02				
Audit Committee Director PPS			-0.0438	0.01		
Individual Outside Director PPS					-0.0542	0.01
CEO PPS	-0.0085	0.51	-0.0072	0.58	-0.0060	0.65
Director Ownership	-0.0018	0.68	-0.0018	0.68	-0.0019	0.66
CEO Ownership	-0.0021	0.54	-0.0021	0.54	-0.0020	0.56
CEO Age	0.0063	0.01	0.0063	0.01	0.0062	0.01
CEO Tenure	-0.0029	0.28	-0.0028	0.30	-0.0030	0.28
Board Size	0.0055	0.49	0.0032	0.69	0.0016	0.85
CEO is Chairman	-0.0436	0.21	-0.0434	0.22	-0.0438	0.21
Percent Outside Directors	0.0010	0.45	0.0005	0.68	0.0004	0.73
Outsiders on Audit	-0.0029	0.01	-0.0024	0.03	-0.0030	0.01
Total Capital	-0.0003	0.73	-0.0002	0.75	-0.0002	0.80
Market-to-Book	0.0000	0.88	0.0000	0.88	0.0000	0.88
R&D	4.7043	0.00	4.7076	0.00	4.7167	0.00
Number of Analysts	-0.0066	0.02	-0.0065	0.02	-0.0065	0.02
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	7,071		7,071		7,071	

Table 4
Director Pay-for-Performance Sensitivity upon the Timeliness and Accuracy of the Earnings Revisions Immediately Following Quarterly EPS Releases

This table reports results from OLS regression tests of whether director incentive compensation relates to the speed and accuracy of the issuance of individual analysts' forecast revisions immediately following the quarterly EPS release for our 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. The dependent variable in Panel A, *Days Until Revision*, is the average number of days following the intra-year quarterly EPS releases until the first revision is issued by each analyst following the firm. is the standard deviation estimates from the first analyst forecast period prior to the earnings announcement. The dependent variable in Panel B, *Pct Error Corrected*, is the average percentage of the initial forecast error corrected (which is established at the beginning of the fiscal year) that has been corrected by the most recent EPS estimate revision for each analyst following the firm. The key independent variables of interest in each panel are *Individual Outside Director PPS*, *Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

Panel A: Average Number of Days Following Quarterly EPS Release Until Analyst Revision

	(1)		(2)		(3)	
	Days Until Revision		Days Until Revision		Days Until Revision	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	10.5484	0.00	10.4439	0.00	11.0768	0.00
Outside Director PPS	-0.4991	0.00				
Audit Committee Director PPS			-0.4304	0.00		
Individual Outside Director PPS					-0.5481	0.00
CEO PPS	-0.1680	0.13	-0.1975	0.07	-0.1822	0.10
Director Ownership	0.0072	0.84	0.0051	0.89	0.0040	0.91
CEO Ownership	-0.0083	0.77	-0.0089	0.76	-0.0082	0.78
CEO Age	0.0542	0.01	0.0551	0.01	0.0538	0.01
CEO Tenure	-0.0667	0.00	-0.0684	0.00	-0.0691	0.00
Board Size	0.2187	0.00	0.1989	0.00	0.1807	0.01
CEO is Chairman	-0.0968	0.75	-0.0692	0.82	-0.0822	0.78
Percent Outside Directors	0.0232	0.03	0.0179	0.10	0.0171	0.11
Outsiders on Audit	-0.0148	0.11	-0.0103	0.28	-0.0161	0.08
Total Capital	0.0229	0.00	0.0229	0.00	0.0235	0.00
Market-to-Book	-0.0016	0.42	-0.0016	0.41	-0.0016	0.41
R&D	4.3197	0.05	4.0057	0.06	4.1190	0.06
Number of Analysts	-0.3096	0.00	-0.3120	0.00	-0.3120	0.00
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	7,071		7,071		7,071	

Panel B: Percentage of Analysts' Forecast Error Corrected Immediately Following Quarterly EPS Release

	(1)		(2)		(3)	
	Pct Error Corrected		Pct Error Corrected		Pct Error Corrected	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-14.4881	0.62	-14.2256	0.63	-17.7093	0.55
Outside Director PPS	3.2237	0.00				
Audit Committee Director PPS			3.6880	0.00		
Individual Outside Director PPS					3.4287	0.01
CEO PPS	-0.4999	0.57	-0.5689	0.52	-0.3769	0.67
Director Ownership	0.3172	0.28	0.3184	0.28	0.3396	0.25
CEO Ownership	-0.0591	0.80	-0.0600	0.80	-0.0589	0.80
CEO Age	-0.1132	0.51	-0.1128	0.51	-0.1122	0.51
CEO Tenure	0.0688	0.71	0.0652	0.73	0.0857	0.65
Board Size	0.1439	0.79	0.3347	0.55	0.3768	0.50
CEO is Chairman	0.6566	0.79	0.6131	0.80	0.5370	0.82
Percent Outside Directors	-0.3184	0.00	-0.2805	0.00	-0.2797	0.00
Outsiders on Audit	0.0615	0.41	0.0193	0.80	0.0700	0.35
Total Capital	0.0063	0.90	0.0054	0.92	0.0024	0.96
Market-to-Book	-0.0133	0.40	-0.0133	0.40	-0.0133	0.40
R&D	-28.5521	0.11	-28.5198	0.11	-27.0684	0.13
Number of Analysts	0.2439	0.19	0.2400	0.20	0.2615	0.16
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	7,071		7,071		7,071	

Table 5
Director Pay-for-Performance Sensitivity and Earnings Surprises for Firms with Downward Revisions in EPS Estimates

This table reports results from logistic regressions for our 3,603 sample firm year observations that experienced a downward revision subsequent to receiving a positively biased initial earnings estimate. The dependent variable in Panel A, *Downward and Meet*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised downward such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. The dependent variable in Panel B, *Downward and Beat*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised downward but the actual earnings significantly beat expectations (EPS Actual - EPS Est > $0.03) and zero otherwise. The dependent variable in Panel C, *Downward and Miss*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised downward and the actual earnings miss expectations (EPS Actual - EPS Est < $0.00) and zero otherwise. The key independent variables of interest in each panel are *Individual Outside Director PPS*, *Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

Panel A: Downward Revision and Meets EPS Expectations

	(1) Downward and Meet		(2) Downward and Meet		(3) Downward and Meet	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.8545	0.04	-0.7839	0.06	-1.0512	0.01
Outside Director PPS	0.2088	0.00				
Audit Committee Director PPS			0.2186	0.00		
Individual Outside Director PPS					0.2297	0.00
CEO PPS	0.0612	0.04	0.0632	0.03	0.0672	0.02
Director Ownership	-0.0123	0.20	-0.0120	0.21	-0.0115	0.23
CEO Ownership	0.0038	0.60	0.0040	0.58	0.0039	0.60
CEO Age	-0.0005	0.93	-0.0008	0.89	-0.0005	0.93
CEO Tenure	-0.0033	0.58	-0.0031	0.61	-0.0024	0.69
Board Size	-0.0303	0.09	-0.0190	0.29	-0.0142	0.44
CEO is Chairman	-0.0610	0.43	-0.0676	0.38	-0.0677	0.38
Percent Outside Directors	-0.0082	0.00	-0.0059	0.03	-0.0055	0.05
Outsiders on Audit	-0.0001	0.95	-0.0025	0.30	0.0002	0.92
Total Capital	-0.0002	0.91	-0.0002	0.90	-0.0006	0.76
Market-to-Book	0.0000	0.99	0.0001	0.97	0.0001	0.96
R&D	-1.1968	0.03	-1.1463	0.03	-1.0957	0.04
Number of Analysts	0.0163	0.01	0.0162	0.01	0.0174	0.00
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Meet Estimate = 1	1,443		1,443		1,443	
Meet Estimate = 0	2,160		2,160		2,160	
N	3,603		3,603		3,603	

Panel B: Downward Revision and Beats EPS Expectations

	(1) Downward and Beat		(2) Downward and Beat		(3) Downward and Beat	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-1.9304	0.00	-1.9446	0.00	-1.7622	0.00
Outside Director PPS	-0.0993	0.01				
Audit Committee Director PPS			-0.1330	0.00		
Individual Outside Director PPS					-0.1449	0.01
CEO PPS	0.0502	0.13	0.0572	0.08	0.0551	0.10
Director Ownership	0.0029	0.77	0.0031	0.75	0.0028	0.78
CEO Ownership	-0.0047	0.57	-0.0047	0.57	-0.0047	0.57
CEO Age	0.0061	0.31	0.0060	0.31	0.0057	0.34
CEO Tenure	-0.0047	0.46	-0.0044	0.50	-0.0047	0.47
Board Size	0.0249	0.20	0.0181	0.35	0.0143	0.47
CEO is Chairman	0.1612	0.06	0.1604	0.06	0.1579	0.06
Percent Outside Directors	0.0076	0.01	0.0065	0.03	0.0063	0.04
Outsiders on Audit	0.0001	0.97	0.0016	0.56	-0.0001	0.98
Total Capital	-0.0023	0.33	-0.0023	0.33	-0.0020	0.39
Market-to-Book	0.0024	0.36	0.0024	0.35	0.0024	0.35
R&D	1.0358	0.06	1.0700	0.05	1.0451	0.06
Number of Analysts	-0.0030	0.66	-0.0023	0.73	-0.0029	0.66
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Beat Estimate = 1	1,002		1,002		1,002	
Beat Estimate = 0	2,601		2,601		2,601	
N	3,603		3,603		3,603	

Panel C: Downward Revision and Misses EPS Expectations

	(1) Downward and Miss		(2) Downward and Miss		(3) Downward and Miss	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0.3867	0.36	0.3265	0.44	0.4635	0.28
Outside Director PPS	-0.1327	0.00				
Audit Committee Director PPS			-0.1148	0.00		
Individual Outside Director PPS					-0.1219	0.02
CEO PPS	-0.1024	0.00	-0.1103	0.00	-0.1120	0.00
Director Ownership	0.0102	0.26	0.0097	0.28	0.0095	0.29
CEO Ownership	-0.0004	0.96	-0.0007	0.93	-0.0007	0.93
CEO Age	-0.0047	0.41	-0.0044	0.44	-0.0044	0.43
CEO Tenure	0.0073	0.23	0.0068	0.26	0.0064	0.29
Board Size	0.0098	0.60	0.0042	0.82	0.0019	0.92
CEO is Chairman	-0.0787	0.32	-0.0718	0.37	-0.0702	0.38
Percent Outside Directors	0.0019	0.51	0.0006	0.84	0.0003	0.92
Outsiders on Audit	0.0002	0.94	0.0013	0.59	-0.0001	0.97
Total Capital	0.0020	0.33	0.0020	0.33	0.0022	0.28
Market-to-Book	-0.0056	0.31	-0.0057	0.30	-0.0059	0.30
R&D	0.3085	0.57	0.2282	0.67	0.2030	0.71
Number of Analysts	-0.0163	0.01	-0.0168	0.01	-0.0175	0.01
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Miss Estimate = 1	1,158		1,158		1,158	
Miss Estimate = 0	2,445		2,445		2,445	
N	3,603		3,603		3,603	

Table 6
Director Pay-for-Performance Sensitivity and Earnings Surprises for Firms with Upward Revisions in EPS Estimates

This table reports results from logistic regressions for our 2,860 sample firm year observations that experienced an upward revision subsequent to receiving a negatively biased initial earnings estimate. The dependent variable in Panel A, *Upward and Meet*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised upward such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. The dependent variable in Panel B, *Upward and Beat*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised upward but the actual earnings significantly beat expectations (EPS Actual - EPS Est > $0.03) and zero otherwise. The dependent variable in Panel C, *Upward and Miss*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised upward and the actual earnings miss expectations (EPS Actual - EPS Est < $0.00) and zero otherwise. The key independent variables of interest in each panel are *Individual Outside Director PPS*, *Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

Panel A: Upward Revision and Meets EPS Expectations

	(1)		(2)		(3)	
	Upward and Meet		Upward and Meet		Upward and Meet	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.1859	0.69	-0.1305	0.78	-0.2346	0.62
Outside Director PPS	0.0941	0.02				
Audit Committee Director PPS			0.0769	0.06		
Individual Outside Director PPS					0.0880	0.07
CEO PPS	-0.0032	0.92	0.0025	0.94	0.0020	0.95
Director Ownership	0.0012	0.92	0.0018	0.88	0.0024	0.84
CEO Ownership	-0.0089	0.33	-0.0089	0.33	-0.0090	0.33
CEO Age	-0.0057	0.36	-0.0059	0.35	-0.0058	0.36
CEO Tenure	0.0103	0.14	0.0107	0.12	0.0109	0.11
Board Size	-0.0026	0.89	0.0005	0.98	0.0028	0.89
CEO is Chairman	-0.0191	0.83	-0.0254	0.77	-0.0238	0.79
Percent Outside Directors	-0.0125	0.00	-0.0114	0.00	-0.0114	0.00
Outsiders on Audit	0.0042	0.13	0.0033	0.24	0.0045	0.11
Total Capital	-0.0005	0.76	-0.0005	0.75	-0.0006	0.73
Market-to-Book	0.0167	0.02	0.0169	0.02	0.0169	0.02
R&D	-1.1074	0.11	-1.0280	0.13	-1.0433	0.13
Number of Analysts	0.0213	0.00	0.0220	0.00	0.0220	0.00
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Meet Estimate = 1	1,350		1,350		1,350	
Meet Estimate = 0	1,510		1,510		1,510	
N	2,860		2,860		2,860	

Panel B: Upward Revision and Beats EPS Expectations

	(1)		(2)		(3)	
	Upward and Beat		Upward and Beat		Upward and Beat	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-1.1296	0.02	-1.1546	0.02	-1.0507	0.03
Outside Director PPS	-0.0361	0.39				
Audit Committee Director PPS			-0.0257	0.54		
Individual Outside Director PPS					-0.0578	0.24
CEO PPS	0.0381	0.27	0.0347	0.31	0.0419	0.22
Director Ownership	-0.0245	0.11	-0.0248	0.11	-0.0245	0.11
CEO Ownership	0.0164	0.09	0.0163	0.09	0.0165	0.09
CEO Age	-0.0016	0.81	-0.0015	0.82	-0.0018	0.79
CEO Tenure	-0.0166	0.03	-0.0168	0.02	-0.0165	0.03
Board Size	0.0083	0.69	0.0074	0.72	0.0030	0.89
CEO is Chairman	0.2152	0.02	0.2184	0.02	0.2117	0.02
Percent Outside Directors	0.0117	0.00	0.0113	0.00	0.0110	0.00
Outsiders on Audit	-0.0021	0.48	-0.0018	0.55	-0.0022	0.46
Total Capital	-0.0044	0.06	-0.0044	0.06	-0.0044	0.06
Market-to-Book	-0.0133	0.11	-0.0135	0.10	-0.0129	0.12
R&D	1.1611	0.10	1.1234	0.11	1.2029	0.09
Number of Analysts	-0.0171	0.02	-0.0174	0.01	-0.0168	0.02
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Beat Estimate = 1	938		938		938	
Beat Estimate = 0	1,922		1,922		1,922	
N	2,860		2,860		2,860	

Panel C: Upward Revision and Misses EPS Expectations

	(1)		(2)		(3)	
	Upward and Miss		Upward and Miss		Upward and Miss	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-1.1233	0.04	-1.1744	0.03	-1.0288	0.07
Outside Director PPS	-0.0974	0.05				
Audit Committee Director PPS			-0.0852	0.09		
Individual Outside Director PPS					-0.1056	0.07
CEO PPS	-0.0390	0.30	-0.0434	0.25	-0.0412	0.28
Director Ownership	0.0237	0.07	0.0231	0.08	0.0232	0.08
CEO Ownership	-0.0085	0.48	-0.0084	0.48	-0.0084	0.48
CEO Age	0.0117	0.13	0.0118	0.13	0.0117	0.13
CEO Tenure	0.0062	0.46	0.0060	0.48	0.0059	0.48
Board Size	-0.0054	0.82	-0.0091	0.71	-0.0140	0.57
CEO is Chairman	-0.2586	0.01	-0.2529	0.02	-0.2576	0.02
Percent Outside Directors	0.0035	0.37	0.0024	0.54	0.0021	0.60
Outsiders on Audit	-0.0036	0.29	-0.0026	0.46	-0.0038	0.26
Total Capital	0.0042	0.02	0.0042	0.02	0.0042	0.02
Market-to-Book	-0.0111	0.26	-0.0112	0.27	-0.0111	0.27
R&D	0.1373	0.87	0.0674	0.94	0.1241	0.89
Number of Analysts	-0.0073	0.37	-0.0079	0.33	-0.0075	0.36
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Miss Estimate = 1	572		572		572	
Miss Estimate = 0	2,288		2,288		2,288	
N	2,860		2,860		2,860	

Table 7
Director Pay-for-Performance Sensitivity and Earnings Management for Firms with Positively or Negatively Biased Estimates

This table reports results from OLS regressions for our 3,838 and 3,233 sample firm year observations in Panels A and B that experienced positively biased and negatively biased initial earnings estimates, respectively. We define a *positively biased estimate* (*negatively biased estimate*) as one where the initial analyst forecast is greater than (less than) the actual reported earnings. The dependent variable in both panels, *Earnings Management*, is defined as discretionary current accruals using the Modified Jones (1991) model as computed by Dechow, Sloan, and Sweeney (1996). The key independent variables of interest in each panel are *Individual Outside Director PPS*, *Audit Committee Director PPS* and *Outside Director PPS*. These are defined as the natural log of the sensitivity of the value this portfolio to a 1% change in stock price for the each individual outside director, the audit committee, and for the outsiders as a whole, respectively. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

Panel A: Earnings Management for Firms with Positively Biased Estimates

	(1) Earnings Management		(2) Earnings Management		(3) Earnings Management	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.0870	0.62	-0.0920	0.60	-0.0805	0.65
Outside Director PPS	-0.0070	0.59				
Audit Committee Director PPS			-0.0016	0.91		
Individual Outside Director PPS					-0.0067	0.68
CEO PPS	0.0227	0.03	0.0211	0.04	0.0222	0.03
Director Ownership	0.0038	0.22	0.0038	0.23	0.0038	0.22
CEO Ownership	0.0008	0.75	0.0008	0.76	0.0008	0.75
CEO Age	0.0021	0.27	0.0021	0.27	0.0021	0.27
CEO Tenure	-0.0004	0.83	-0.0005	0.80	-0.0005	0.82
Board Size	-0.0043	0.51	-0.0044	0.50	-0.0048	0.46
CEO is Chairman	-0.0112	0.68	-0.0104	0.70	-0.0111	0.68
Percent Outside Directors	-0.0009	0.37	-0.0010	0.33	-0.0010	0.32
Outsiders on Audit	0.0004	0.60	0.0004	0.61	0.0004	0.62
Total Capital	0.0005	0.44	0.0005	0.43	0.0005	0.43
Market-to-Book	0.0001	0.71	0.0001	0.71	0.0001	0.71
R&D	-0.4733	0.01	-0.4807	0.01	-0.4755	0.01
Number of Analysts	-0.0040	0.07	-0.0041	0.06	-0.0040	0.07
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	3,838		3,838		3,838	

Panel B: Earnings Management for Firms with Negatively Biased Estimates

	(1) Earnings Management		(2) Earnings Management		(3) Earnings Management	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.2926	0.09	-0.2770	0.11	-0.2976	0.09
Outside Director PPS	0.0147	0.25				
Audit Committee Director PPS			0.0054	0.68		
Individual Outside Director PPS					0.0113	0.45
CEO PPS	-0.0168	0.10	-0.0145	0.15	-0.0156	0.12
Director Ownership	0.0040	0.30	0.0042	0.28	0.0041	0.29
CEO Ownership	0.0013	0.65	0.0013	0.65	0.0013	0.66
CEO Age	-0.0017	0.39	-0.0018	0.38	-0.0017	0.39
CEO Tenure	0.0012	0.57	0.0014	0.53	0.0013	0.54
Board Size	0.0149	0.02	0.0150	0.02	0.0158	0.02
CEO is Chairman	0.0110	0.70	0.0092	0.74	0.0102	0.72
Percent Outside Directors	0.0001	0.90	0.0003	0.80	0.0003	0.76
Outsiders on Audit	-0.0002	0.82	-0.0002	0.79	-0.0002	0.85
Total Capital	-0.0006	0.26	-0.0006	0.25	-0.0006	0.25
Market-to-Book	-0.0002	0.81	-0.0002	0.83	-0.0002	0.82
R&D	-0.5650	0.01	-0.5483	0.02	-0.5586	0.02
Number of Analysts	-0.0006	0.78	-0.0003	0.89	-0.0004	0.84
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
N	3,233		3,233		3,233	

Table 8
Firm Fixed Effects Regressions of Director Pay-for-Performance Sensitivity on Forecast Errors, Revisions, and Earnings Management

This table presents firm fixed effects models of director PPS on our measures for expectations and earnings management for the 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. Model (1) is a logistic regression where the dependent variable, *Small Initial Error*, is a dummy variable that equals '1' if the initial EPS forecast is within +/- $0.03 of the actual reported earnings number. Model (2) is an OLS regression where the dependent variable, *Std Dev of Analyst Est*, is the standard deviation of the estimates from the final analyst forecast period prior to the earnings announcement. Model (3) is a logistic regression where the dependent variable, *Revision and Meet*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. Model (4) is an OLS regression where the dependent variable, *Earnings Management*, is defined as discretionary current accruals using the Modified Jones (1991) model as computed by Dechow, Sloan, and Sweeney (1996). Model (4) is run using only the 3,838 sample firm year observations that experienced positively biased initial earnings estimate. The key independent variable of interest is *Outside Director PPS*. This is defined as the natural log of the value sensitivity of the outside directors' option portfolio to a 1% change in stock price. *CEO PPS* is the natural log of the sensitivity of the CEO's option portfolio to a 1% change in stock price. All other variables are defined in Table 1.

	(1) Small Initial Error		(2) Std Dev of Analyst Est		(3) Revision and Meet		(4) Earnings Management	
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Outside Director PPS	0.1386	0.09	-0.0348	0.03	0.1259	0.05	0.0344	0.24
CEO PPS	0.0434	0.45	-0.0168	0.15	0.0470	0.27	0.0188	0.36
Director Ownership	0.0149	0.30	0.0000	1.00	-0.0562	0.34	-0.0030	0.61
CEO Ownership	0.0005	0.97	-0.0016	0.60	0.0030	0.78	0.0049	0.40
CEO Age	0.0172	0.13	-0.0013	0.57	-0.0018	0.83	-0.0029	0.47
CEO Tenure	-0.0054	0.69	0.0021	0.45	0.0043	0.67	-0.0005	0.91
Board Size	-0.0641	0.10	0.0017	0.83	0.0045	0.87	0.0104	0.47
CEO is Chairman	0.1262	0.30	-0.0056	0.82	0.0029	0.97	-0.0028	0.95
Percent Outside Directors	-0.0029	0.58	-0.0004	0.73	-0.0029	0.46	-0.0015	0.43
Outsiders on Audit	-0.0020	0.55	-0.0004	0.62	0.0013	0.63	-0.0001	0.95
Total Capital	-0.0030	0.52	0.0000	0.98	-0.0431	0.00	0.0003	0.91
Market-to-Book	-0.0064	0.40	0.0000	0.91	0.0092	0.73	0.0000	0.91
R&D	-0.5345	0.74	-4.1866	0.00	-0.6207	0.61	-0.2987	0.60
Number of Analysts	0.0011	0.93	-0.0021	0.45	0.0217	0.03	-0.0006	0.91
Firm Fixed Effects	Yes		Yes		Yes		Yes	
Industry Fixed Effects	No		No		No		No	
Year Fixed Effects	Yes		Yes		Yes		Yes	

Table 9
Director Pay-for-Performance Sensitivity for Only Previously Granted Options on Forecast Errors, Revisions, and Earnings Management

This table presents firm regression models of director PPS on our measures for expectations and earnings management for the 7,071 sample firm year observations with complete data on RiskMetrics (IRRC), I/B/E/S, Compustat, and Execucomp for the years 1997-2006. Model (1) is a logistic regression where the dependent variable, *Small Initial Error*, is a dummy variable that equals '1' if the initial EPS forecast is within +/- $0.03 of the actual reported earnings number. Model (2) is an OLS regression where the dependent variable, *Std Dev of Analyst Est*, is the standard deviation of the estimates from the final analyst forecast period prior to the earnings announcement. Model (3) is a logistic regression where the dependent variable, *Revision and Meet*, is a dummy variable that equals '1' if the analysts' initial forecasts are revised such that the actual earnings just meet expectations ($0.00 ≥ EPS Actual - EPS Est ≥ $0.03) and zero otherwise. Model (4) is an OLS regression where the dependent variable, *Earnings Management*, is defined as discretionary current accruals using the Modified Jones (1991) model as computed by Dechow, Sloan, and Sweeney (1996). Model (4) is run using only the 3,838 sample firm year observations that experienced positively biased initial earnings estimate. The key independent variable of interest in each model is *Outside Director 4-year PPS* and is defined as the natural log of the sensitivity of the value the four-year option portfolio, which excludes the current option grants (i.e. only (t-4) to (t-1) grants), to a 1% change in stock price for the outsiders directors. *CEO 4-year PPS* is the natural log of the sensitivity of the CEO's option portfolio, which excludes the current option grants, to a 1% change in stock price. All other variables are defined in Table 1.

	(1) Small Initial Error		(2) Std Dev of Analyst Est		(3) Revision and Meet		(4) Earnings Management	
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-2.7333	0.93	0.2275	0.60	-0.8612	0.00	-0.0729	0.67
Outside Director 4-year PPS	0.1438	0.00	-0.0287	0.04	0.1431	0.00	-0.0042	0.72
CEO 4-year PPS	0.0173	0.47	-0.0072	0.52	0.0448	0.01	0.0193	0.03
Director Ownership	0.0026	0.76	-0.0020	0.65	-0.0033	0.62	0.0037	0.23
CEO Ownership	-0.0072	0.33	-0.0019	0.58	0.0006	0.92	0.0007	0.78
CEO Age	-0.0051	0.34	0.0065	0.01	0.0002	0.95	0.0021	0.27
CEO Tenure	0.0123	0.03	-0.0030	0.27	-0.0003	0.95	-0.0008	0.70
Board Size	0.0082	0.62	0.0055	0.50	-0.0191	0.13	-0.0038	0.55
CEO is Chairman	0.0157	0.84	-0.0431	0.22	-0.0028	0.96	-0.0090	0.74
Percent Outside Directors	-0.0057	0.03	0.0009	0.47	-0.0103	0.00	-0.0009	0.36
Outsiders on Audit	-0.0027	0.21	-0.0030	0.01	0.0019	0.25	0.0004	0.63
Total Capital	0.0016	0.26	-0.0003	0.74	-0.0004	0.71	0.0005	0.45
Market-to-Book	-0.0002	0.80	0.0000	0.87	-0.0002	0.72	0.0001	0.70
R&D	-1.2755	0.03	4.6795	0.00	-0.9992	0.01	-0.4698	0.02
Number of Analysts	0.0001	0.98	-0.0073	0.01	0.0202	0.00	-0.0037	0.08
Industry Fixed Effects	Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes	